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The Economics Of Individual Philanthropy: Essays On Religiosity, And Charitable Giving By Married Couples

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THE ECONOMICS OF INDIVIDUAL PHILANTHROPY: ESSAYS ON RELIGIOSITY, AND CHARITABLE GIVING BY MARRIED COUPLES

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ABSTRACT

This dissertation investigates the market of individual philanthropy through two essays on religiosity and charitable giving by married couples. The second chapter examines whether people who engage in religious activities are more generous in terms of both religious and secular giving and whether gender differences exist in charitable giving within different levels of religiosity. The results of bivariate probit and tobit analyses show that religious people have a greater propensity to give and higher levels of giving to both religious and secular charitable organizations. A zero-inflated ordered probit model is used to analyze an individual donor's decision-making process, and the results reveal that gender-based distinctions differ between religious and less-religious individuals in both magnitude and sign, although no gender difference is found for the whole sample. Since little research exists on the bargaining power of married couples over giving to charities, using newly available panel data on U.S. households from the Center on Philanthropy Panel Study, the third chapter investigates the question of who has relatively greater bargaining power when the husband and the wife make charitable giving decisions together. Results suggest that the husband, on average, has significantly greater bargaining power than the wife, and bargaining over charitable giving reduces household giving by 8 percent. Moreover, the joint decision made by a family with traditional views on gender roles tends to have the husband with even more bargaining power.

DEDICATION

This dissertation is dedicated to my dear parents for their unconditional love and endless support, and to the memory of my grandfather, a wonderful person whom I still miss every day.

LIST OF ABBREVIATIONS AND SYMBOLS

BVP	Bivariate Probit
BVT	Bivariate Tobit
COPPS	Center on Philanthropy Panel Study
PSID	Panel Study of Income Dynamics
ZIOP	Zero Inflated Ordered Probit

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TABLE OF CONTENTS

LSIT OF TABLES

"To give away money is an easy matter and in any man's power. But to decide to whom to give it, and how large, and when, and for what purpose and how, is neither in every man's power nor an easy matter."

-Aristotle

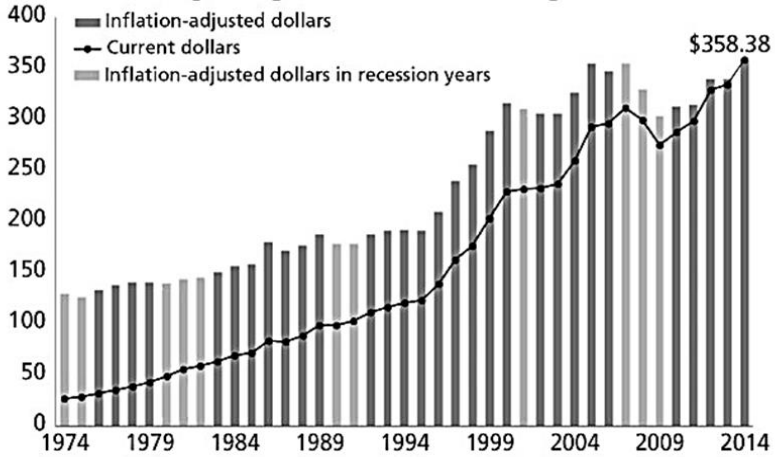
CHAPTER 1

INTRODUCTION

Philanthropy is a promising and quickly growing market. Total giving to charitable organizations in United States was $358.38 billion in 2014 (about 2.1% of GDP). This is an increase of 7.1% from 2013, and 85% from that in the late 1990s.[1] Total charitable giving in United States has been on a steady rise since 1974, with only a temporary drop during the recession period. The trend in charitable giving over the last 40 years is shown in Figure 1. With a continuous rise for five years in a row, donations to charity reached record highs in 2014, passing the previous record set in 2007 before the recession began. Moreover, it is estimated that total charitable contributions will total between $21.2 to $55.4 trillion in between 1998-2052. [2]

[1] Giving USA 2015: The Annual Report on Philanthropy for the Year 2014.
[2] The 2010 Bank of America Study of High Net Worth Philanthropy conducted by the Center on Philanthropy at Indiana University.

Figure 1. Trend in total charitable giving

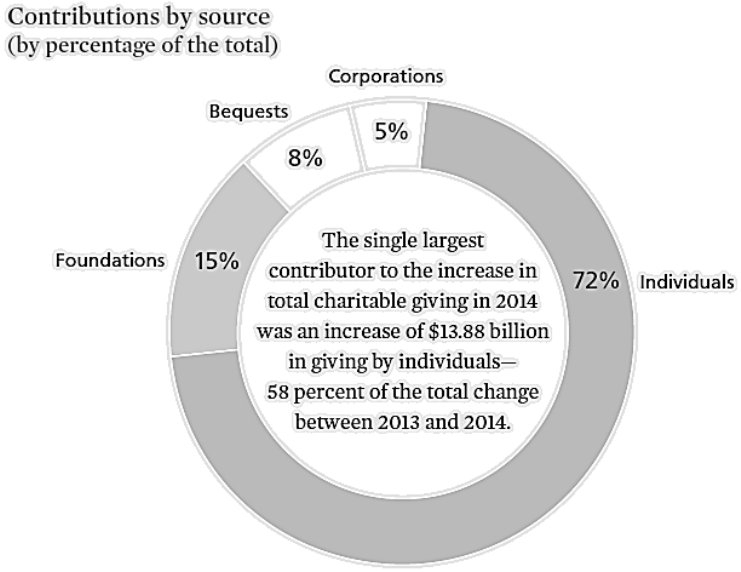


Source: Giving USA Foundation, Giving USA 2015 (in billions of dollars).

The big number of charitable giving mainly comes from four sources which include individuals, charitable foundations, corporations, and bequests. Among these four sources, charitable giving by individuals has been historically the major source of the total charitable giving. As in previous years, the majority of charitable giving in 2014 came from individuals. Specifically, individuals gave roughly $258.51 billion (representing a 7.4% increase over 2013).[3] Figure 2 shows that in 2014 the charitable giving came from individuals at $258.51 billion, or 72% of total giving; followed by foundations ($53.97 billion/15%), bequests ($28.13 billion/8%), and corporations ($17.77 billion/5%). Nevertheless, individual giving keeps a steady rise. It has been clear gains in the total amount given by individuals in the last couple of years. In fact, the rise in contributions by individuals between 2011 and 2013 represents 73 percent of the growth in total giving during that period.[4]

[3] The Urban Institute, National Center for Charitable Statistics.
[4] Source: seminal annual report on charitable giving in America, The 59th consecutive edition of Giving USA.

Figure 2. Percentage of Sources of Private Philanthropy, 2014



Source: An overview of giving in 2014, Giving USA 2015 Highlights.

Although individual philanthropy funding has a steadily rising trend, the access of nonprofit organizations to financial resources is becoming increasingly competitive, leading to greater competition among charities for private donations and thereby urging policymakers to formulate effective fundraising plans. Therefore, a deep understanding of the growing individual charitable giving market is indispensable for policy makers of fundraising organizations. Correspondingly, considerable scholarly attention has been paid to studying the donation behavior of individuals and households. This dissertation therefore concentrates on investigating the individual philanthropy.

Decades of research on the individual philanthropy indicates that higher levels of charitable giving are positively associated with higher income, higher wealth, greater religious participation, volunteerism, age, marriage, higher educational attainment, US citizenship, higher

proportion of earned wealth versus inherited wealth, and a greater level of financial security (O'Herlihy, Havens, and Schervish 2002). For instance, as people get older they are typically more likely to give to charity and to give a greater fraction of their incomes. Likewise, those with more education give more often, give more dollars, and generally give a higher fraction of income. However, how gender, ethnicity, or religion, among other demographic characteristics impact participation in giving and amounts donated is more complex (O'Herlihy et al., 2002).

Over 80% of the U.S. population expressed affiliation with a faith denomination. 88% American adults say that "my religious faith is very important in my life" (Showers et al. 2011). Therefore, religiosity, as a measure of the importance of religion to people, has been used in numerous researches. In a narrow sense, religiosity indicates how religious an individual is, regardless how an individual is religious. Published statistics show that religion plays a major role in how much money Americans give to charity. In particular, among Americans who claim a religious affiliation, 65 percent give to charity; among those who do not identify to be religious, 56 percent make charitable gifts.[5] From these general statistics, the parts of the country that tend to be more religious are also more generous.[6] However, this is not the case based on the numerous existing studies. Due to the importance of religion to people's behaviors, the link between religiosity and pro-social behavior, such as charitable giving, altruism, cooperation, helping, and volunteering, are widely studied in the literature. However, evidence in the literature on the causal relationship between the degree of religiosity and charitable giving (particularly secular giving) is still mixed for several reasons.

The first reason could be the aggregated level of giving. Many previous studies investigate the causal relationship between religiosity and total giving. However, since there are

[5] Source: Religious Americans Give More, New Study Finds, The Chronicle of Philanthropy (NOVEMBER 25, 2013).
[6] Source: How American Gives, The Chronicle of Philanthropy.

different forces at work in shaping both religious and secular giving, empirical studies of charitable giving should work with disaggregated measures of giving (instead of total giving) whenever possible (Brown and Ferris, 2007; and Helms and Thornton, 2012). The second reason could be misspecification. Many previous studies of charitable giving and religiosity focus on giving at disaggregated levels, but they estimate religious giving and secular giving separately. This could cause inefficient and biased estimates because unobserved characteristics, such as donors' tastes and attitudes towards money, are not accounted for in estimating the separate models. For an individual, religious giving and secular giving can be statistically correlated because the individual is likely to receive similar "warm glows" from both types of giving. A more appropriate to model charitable giving to different types of organizations will be a simultaneous system. Although some previous studies use methodologies of simultaneous system, the interpretations of the results are problematic. For bivariate or multivariate models, it is more appropriate to interpret the marginal effects rather than the yielded coefficients. For these mentioned reasons, the causal relationship between religiosity and giving is far from clear and worth more investigations.

In the first essay, the goal is to address two research questions. First, whether religious people are more generous in terms of both religious and secular giving compared with less-religious people, from both theoretical and empirical aspects. Second, whether gender differences exist in charitable giving for donor groups with different levels of religiosity, which is an extension of the first question.

Using the 2001 survey data, chapter 2 uses the system of bivariate probit and bivariate tobit models to control for the potential correlation that might be caused by unobservable individual characteristics between religious giving and secular giving simultaneously, together

with appropriate interpretations. Additionally, evidence on the causal relationship between religiosity and charitable giving is limited from a theoretical prospective. According to the literature, religion motivates religious people to give more because it creates a social context in which people are more likely to give; religion also shapes people's opinions about what is right and wrong and increases concern about other people's wellbeing. Previous studies hypothesize that more religious people are more generous, without constructing the theoretical models. But why are religious people more generous than non-religious people, theoretically? In order to bridge the gap in the previous studies, chapter 2 also offers a theoretical framework to explain the empirical findings.

Both the theoretical and empirical findings on the first research question show that religious people have a greater propensity to give as well as higher levels of giving to both religious and secular organizations. The bivariate systems permit a test of the correlation across the different giving decisions, and the correlation between religious and secular giving is highly significant. After controlling for this correlation, the impacts of religiosity on religious and secular giving are smaller than expected.

Since results from the first research question in chapter 2 show that people's generosity increases with their religiosities, we may wonder whether men and women who have high religiosity would be equally generous in charitable giving. If the gender difference in charitable giving does exist, then to what extent does gender difference affect giving among religious people? Is the difference likely to be negligible since religious men and women are both generous donors? Are they both generous among different levels of giving (e.g., low, medium, and high)? If there is no difference in giving according to gender, then is it necessarily true that there is no gender difference between secular men and women? Therefore, chapter 2 investigates

how gender differences affect charitable giving according to different levels of religiosity. Particularly, Chapter 2 demonstrates that previous empirical analyses on gender difference in giving masked important differences among donor groups with different religiosities. Empirical findings show that there are essentially no differences in the propensity of men and women to give to charity, however, this conclusion changes when taking religiosity into account. Gender difference exists between highly religious men and women only for low-level giving. In contrast, gender differences exist between less-religious men and women for all levels of giving (e.g., low, medium, and high).

Perhaps the most important contribution of the study conducted in Chapter 2 to the body of literature on charitable giving is using a zero-inflated ordered probit (ZIOP hereafter) model, first proposed by Harris and Zhao (2007), to disentangle the effects of gender on the decision of whether and how much to donate. In fact, the impact of gender on the two decisions of whether to donate and how much to donate can differ in magnitude and in presentation. The failure to disentangle the varying effects of gender on generosity can cause bias in the estimation. Therefore chapter 2 attempts to reduce such bias by using a ZIOP model to distinguish the decision to donate and the decision of how much to donate. The investigation using ZIOP approach is the first know attempt to deconstruct people's decision-making processes when the dependent variable "level of charitable giving" is ordered discretely. No analysis on charitable giving has thus far used the ZIOP approach.

For the research of people's charitable giving behaviors, survey data and experimental data are widely used. In conducting interviews for survey data, one representative is typically interviewed to answer a survey for the whole household. Most research on charitable giving thus assumes that decisions on charitable giving are a household decision rather than an individual

decision. This is a very restrictive assumption. In fact, household decisions are normally made through bargaining, and the bargaining process depends on the balance of power between the husband and the wife. Consequently, spouses bargain over most household outcomes, including charitable giving.

However, little attention has been paid to this problem, and therefore little research exists on the bargaining power in married couples concerning charitable giving. Despite all this, the existing evidence on the intra-household bargaining over charitable giving is limited (Andreoni et al., 2003; Yoruk, 2009). In the second essay "Charitable Giving by Married Couples: Who Is Prevailing in the Bargaining", the goal is to present new evidence on the effects of bargaining over giving to charities. Using the longitudinal surveys of U.S. households in 2003 and 2005 by the Center on Philanthropy Panel Study, chapter 3 not only aims to investigate the question of who has greater bargaining power when husband and wife make charitable giving decisions together, but also aims to provide new insights into the question of who is prevailing in the bargaining over charitable giving by investigating the theory of traditional views on gender roles.

Existing studies use either pooled cross-sectional or cross-sectional data, under the very restrictive assumption that there are no unobserved individual effects. However, failure to adequately control for certain unobserved characteristics may cause biased estimators. Chapter 3 attempts to reduce such bias and inconsistency by using a longitudinal dataset, and thus offers new evidence of spousal bargaining over charitable donations within a household. In particular, the quality of the survey data used in this study is superior to other frequently-used household surveys of giving in the literature (Wilhelm, 2006). In addition, chapter 3 provides new insights into the question of "who is prevailing in the intra-household bargaining over charitable giving" by investigating traditional views on gender roles.

Results in chapter 3 show that the husband has significantly greater bargaining power than the wife when they jointly make decisions to give to charities. Instead of being beneficial to the amount of household giving to charities, the household bargaining is costly. The costly household bargaining generally reduces the household donation by 8%. Results in chapter 3 also support the theory of traditional views on gender roles. For strict Protestant couples, the wives indeed have a much lower authority to decide on the household's charitable giving. However for couples who have less or non-protestant denominations, the husbands present a much lower authority but still dominate the decision-making on charitable giving. The bargaining in households with less traditional views on gender roles creates more "negative externalities" which yields a decrease in the amounts donated.

CHAPTER 2

IS HOWARD MORE GENEROUS THAN HEIDI? RELIGIOSITY AND GENDER DIFFERENCE IN CHARITABLE GIVING[7]

2.1 Religiosity, Gender, and Charitable Giving

For purely and impurely altruistic reasons, many individuals donate to charities.[8] Charitable giving by a given individual is often relatively small, but total individual giving represents the largest share of philanthropic funding. For instance, although charitable giving by individuals, foundations, and corporations topped as high as $316 billion in the United States in 2012, individual donations accounted for almost 72% ($229 billion) of the total.[9] Moreover, such donations have risen at a rapid rate over the past two decades: the 2012 figure represented an increase of 85% from the amount given in the late 1990s.[10]

Correspondingly, considerable scholarly attention has been paid to individuals' and households' donation behavior in order to better understand the promising phenomenon of individual philanthropy. Research has consistently shown that an individual's income, education,

[7]I am grateful to Thomas A. Garrett, Natalia Kolesnikova, Walt Mayer, John Conlon, Randall Walsh, Subhayu Bandyopadhyay, Tatevik Sekhposyan, and Nicolas L. Ziebarth for their insightful comments and helpful suggestions. I thank participants at the Southern Economic Association 2013 Annual Conference and the Midwest Economic Association 2014 Annual Conference for valuable comments. I also thank the Center on Wealth and Philanthropy at Boston College for providing the data. All errors are my own.

[8] For impure altruism, please refer to "warm glow," as studied by Andreoni, (1990).

[9] This study defines charitable giving as the donation of money to an organization to benefit others beyond the donor *per se*.

[10] Source: Giving USA 2013 Report Highlights.

and employment status are positively associated with his or her charitable giving behavior. However, there is mixed evidence regarding a causal relationship between the degree of religiosity (defined as the extent of involvement or participation in religious groups and activities) and charitable giving, particularly that of a secular nature.[11,12] For example, Jackson et al. (1995), Brooks (2004), Forbes and Zampelli (2013), and Yoruk (2013) show that higher religiosity is associated with a greater probability of charitable giving to charity and/or higher donations. However, Azzi and Ehrenberg (1975), Gruber (2004), Brooks (2005), and Brown and Ferris (2007) conclude that religiosity negatively affects charitable giving (whether considering religious, secular, or overall giving), while Eckel and Grossman (2003, 2004) find no relationship between religiosity and secular giving.

There are three possible methodological drivers of these mixed results. First, many previous studies investigate the causal relationship between religiosity and *total* giving. However, as suggested by Brown and Ferris (2007), empirical studies of charitable giving should examine domain-disaggregated measures of giving (instead of total giving) whenever possible since different forces motivate generosity in religious and secular spheres. The importance of disaggregating philanthropy in this way has been confirmed by several recent studies, such as Wang and Graddy (2008), List (2011), Showers et al. (2011), and Helms and Thornton (2012). Second, where previous studies of charitable giving and religiosity do consider disaggregated measures of giving, they often estimate religious giving and secular giving *separately* (Lunn, Klay, and Douglass, 2011; Brown and Ferris, 2007; Eckel and Grossman, 2004; Brooks, 2004; Hrung, 2004; Bekkers and Schuyt, 2008). This might cause inefficient and biased estimates

[11] A less commonly used term for religiosity is "religiousness." Religiosity describes how religious an individual is, regardless of what type of religion he or she follows.

[12] Secular giving represents giving to non-religious organizations, such as those in education, human services, and health.

because there is no accounting for unobserved characteristics (e.g., tastes or attitudes toward money) when estimating the separate models. However, religious and secular giving are likely to be statistically correlated since a given individual likely receives similar "warm glows" from both types of giving. Due to these unobserved individual characteristics, it is more appropriate to model charitable giving to different causes as a simultaneous system. Finally, although a handful of previous studies use bivariate or multivariate regression models, the interpretations of the results are often problematic, as they examine the resulting coefficients and not the more appropriate marginal effects. As a result of these methodological shortcomings, the causal relationship between religiosity and charitable giving is far from clear.

To overcome those problems, this study uses bivariate probit (BVP) and bivariate tobit (BVT) models to control for the potential correlation between religious giving and secular giving by the same individual and then draws appropriate interpretations. Through this approach, efficiency is gained due to a statistically significant correlation between the two types of giving (ρ=0.397 (0.028), p-value=0.000). The results show that, compared with less-religious people, religious people are 25% more likely to give and also give an average of $1,028 more to religious organizations. Religious people also give more generously to secular organizations: they are 3% likelier to donate and give an average of $446 more per year compared with less-religious people. The estimated effects of religiosity differ across the different bivariate systems and separate models, suggesting that studies that do not control for correlations between different types of giving yield unreliable estimates of the causal effect of religiosity on giving.

Curiously however, why religious people are more generous than non-religious people? According to Wuthnow (1991) and Bekkers and Schuyt (2008), religion motivates people to give more generously because it creates a social context in which people are not only more aware of

opportunities to give and more likely to be asked to give but also encourage one another to engage in charity. Additionally, religion can shape an individual's opinions about morality, increase their concern for others' wellbeing, foster trust in fellow citizens, and evoke feelings of responsibility for others. For religious people, giving to charity is thus similar to buying a "self-image" (Andreoni, 2006). Despite these arguments, theoretical justifications for a causal relationship between religiosity and charitable giving are limited. Therefore, by extending the framework of Brooks (2004) and Dellavigna, List, and Malmendier (2012), this study contributes to the existing literature by offering a firmer theoretical foundation.

Besides the mixed findings on the causal relationship between religiosity and charitable giving, another interesting debate in the literature on charitable giving surrounds the gender difference in giving. For example, Andreoni et al. (2001), Rooney et al. (2005), Mesch et al. (2006, 2011), and Piper and Schnepf (2008) reach diverse conclusions regarding variations between men and women in terms of charitable giving (i.e., some report that women are more generous than men, while others report the opposite). In contrast, Einolf (2011) and Lo and Tashiro (2013) argue that the gender difference in giving is small or non-existent, and Cox and Deck (2006) suggest that the gender difference is not clear-cut and depends on the decision context. This debate is worth investigating in terms of its interaction with the impact of religiosity on giving. Even if religious people have a greater propensity to give as well as higher levels of charitable giving, it remains unknown whether highly religious men and women are equally generous in giving. If this gender difference exists, then is it smaller among the more religious who are, in general, generous donors? Are men and women equally generous when different levels of giving are considered? If, on the other hand, there is no gender difference in giving, then is it necessarily true that there is also no difference between religious men and

women and between less-religious men and women? Given these open questions at the intersection of religiosity and gender, this study investigates gender differences in charitable giving for donor groups with different levels of religiosity. In so doing, it demonstrates that previous empirical analyses of gender differences in giving masked important differences among donor groups with different levels of religiosity.

To disentangle the effects of gender on the decision to donate and the donation amount, this study uses a zero-inflated ordered probit (ZIOP) model, first proposed by Harris and Zhao (2007). The impact of gender on the two decisions (whether to donate and how much to donate) could differ in both magnitude and sign; failure to disentangle these varying effects of gender on generosity could bias the estimation. Therefore this paper attempts to reduce, if not eliminate, such bias by using a ZIOP model to distinguish the decision to donate from the decision of how much to donate. To do so, the analysis divides an individual's decision-making process into two stages. In stage one, she decides whether to participate in the charitable giving market; if she chooses not to participate, she donates zero. Having decided to participate, an individual then decides how much to donate in stage two. However, the donation could still be zero because of a current high price of giving or low income. Given the existence of two different types of zeroes, a fundamental problem arises with the probit and ordered probit methodologies: traditional probit models cannot disentangle differential influences on the decision to participate and how much to contribute, which may bias the estimates. This study is the first known attempt to decompose the decision-making process if the level of charitable giving is ordered discretely. Similarly, no analysis of charitable giving has thus far used the ZIOP approach. The use of the model here thus marks perhaps the most important contribution of this study to the literature on charitable giving.

2.2 Conceptual Framework

Previous studies have investigated the various motivations that lead people to give to charity. Generally, two types of benefits from charitable giving are documented. Public benefits refer to any potential benefit that a donor may receive from improving the charitable organization's total output. By contrast, private benefits represent any potential benefit that is not related to the level of the charitable organization's output (Vesterlund 2006). Donors receive private benefits in many ways. For instance, giving to charity may make them feel generous and that they have fulfilled their obligations of giving back to society. It may also raise donors' reputations and prestige (Harbaugh 1998). Andreoni (1990) labels these potential private benefits as "warm glow."

Following Harbaugh (1998), this study assumes that the level of the charitable organization's total output does not affect donors' utility of giving and that an individual's donation is not influenced by other donors' contribution decisions.[13] People experience a warm glow when giving to charity.

Suppose individuals have separable preferences, in which each good is classified together with similar goods.[14] Each consumption good other than charitable donations is included into the aggregated consumption good (x), and all charitable giving can be classified into a donation good (g). The preference ordering of various types of charitable giving, conditional on the

[13] Most empirical studies that use survey data show that the benefit people receive from charitable giving is private in nature (Vesterlund 2006). For instance, Ribar and Wilhelm (2002) find that people increase their donations because of private benefits, especially when there are many donors.

[14] The two-stage decision-making process and separable preferences are *not* exactly the same thing. However (weakly) separable preferences are both necessary and sufficient for the second stage. Therefore, while separable preferences do not imply the two-stage decision-making process, the two-stage decision-making process does imply weak separability (see Deaton and Muellbauer 1980).

consumption of the consumption goods not in this set, is (weakly) independent of the consumption levels of those other goods.[15]

To maximize utility, assume an individual has a separable utility function of the form:

$$\text{Max } U(x,g) = u(x) + (\alpha_0 + \alpha_1 r)v(g) \qquad \text{s.t. } px + g = m$$

where the relative price of "all other consumption goods" is p and the price of "charitable giving" is numeraire. The utility function satisfies standard concavity properties such that $u'(\cdot) \geq 0$, $v'(\cdot) \geq 0$, $u''(\cdot) < 0$, and $v''(\cdot) < 0$. It is also assumed that α_0>0 in order to avoid the corner solution.[16] Here, r captures the degree of religiosity for an individual, where $0 \leq r \leq 1$.[17]

With $r = 0$, the utility maximization problem for a perfectly secular individual (S) is

$$\text{Max } U^S(x,g) = u(x) + \alpha_0 v(g) \qquad \text{s.t. } px + g = m$$

With $r = 1$, the utility maximization problem for a perfectly religious individual (R) is

$$\text{Max } U^R(x,g) = u(x) + (\alpha_0 + \alpha_1)v(g) \qquad \text{s.t. } px + g = m$$

So α_0 and $(\alpha_0 + \alpha_1)$ represents the importance of giving for a perfectly secular individual and a perfectly religious individual, respectively. If $\alpha_1 > 0$, the religious individual puts more emphasis on giving. Conversely, if $\alpha_1 < 0$, the religious individual puts less emphasis on giving.

The utility for an individual is maximized when $\frac{U_g}{U_x} = \frac{p_g}{p_x} = \frac{1}{p}$. Thus, using the above utility function, it can be shown that

$$U_g^S = \alpha_0 v_g - u_x/p; \qquad U_x^S = u_x - \alpha_0 p v_g$$

$$U_g^R = (\alpha_0 + \alpha_1)v_g - u_x/p; \qquad U_x^R = u_x - (\alpha_0 + \alpha_1)p v_g$$

[15] Suppose the consumer first divides total expenditure between these two categories and then shares the category-level expenditure across the different items in that group.

[16] When α_0=0, giving to charity would decrease the agent's total utility, and a "corner solution" would arise. Since the tangency condition is not satisfied, the individual is willing to substitute away charitable donations for an extra unit of all other goods. The scenario that an individual dislikes charitable giving is not included in this study.

[17] In the dataset used in the empirical analysis, people's religiosity is denoted as either a "0" or a "1".

It is clear that when $\alpha_1 > 0$, $MU_g^S < MU_g^R$ and $MU_x^S > MU_x^R$.

Therefore we know that by consuming the optimal bundle $(x_S^*(p,m), g_S^*(p,m))$ solved by the perfectly secular individual, the perfectly religious individual is not utility-maximized. This indicates that, given the market price ratio, the perfectly religious individual is more likely to be willing to trade away more of the consumption good for additional giving to charity. In this case, the perfectly religious individual would be better off by choosing to consume another consumption bundle $x_R^*(p,m)$ and $g_R^*(p,m)$, where $x_R^*(p,m) < x_S^*(p,m)$, and $g_R^*(p,m) > g_S^*(p,m)$. Thus, a perfectly religious individual, in general, will spend more of his income on charitable giving than a secular individual.

Now consider a more general case. For an individual with a given degree of religiosity, $(0 < r < 1)$, the first-order condition with respect to charitable giving g is $U_g = (\alpha_0 + \alpha_1 r)v_g - u_x/p = 0$. Differentiating U_g with respect to r yields $U_{gr} = \frac{\partial U_g}{\partial r} = \alpha_1 v_g$. Since finding an optimum requires that $U''(\cdot) < 0$, it is the case that $U_{gg} < 0$. By using the Implicit Function Theorem, we can then derive

$$\text{when } \alpha_1 < 0, \qquad \frac{\partial g}{\partial r} = -\frac{U_{gr}}{U_{gg}} = (-)\left[\frac{sign(-)}{sign(-)}\right] < 0, \text{ and}$$

$$\text{when } \alpha_1 > 0, \qquad \frac{\partial g}{\partial r} = -\frac{U_{gr}}{U_{gg}} = (-)\left[\frac{sign(-)}{sign(-)}\right] > 0$$

When $\alpha_1 > 0$, it implies that a religious individual who has a larger r has a higher preference for charitable giving compared with an individual who has a smaller r. Thus, according to the hypothesis that people with higher religiosity are more generous, we expect to see empirical estimates of $\alpha_1 > 0$.

2.3 Data

The cross-sectional charitable giving dataset used in this study comes from the 2001 "Giving and Volunteering in the United States" survey, which was conducted on 4,178 U.S. households.[18,19] The survey collected data on various types of charitable giving, demographics, and household economic variables. One advantage of this dataset is that it categorizes destinations for charitable giving into religious organizations, youth development, education, health services, human services, political campaigns, and international programs as well as less-formal giving to relatives, friends, neighbors, and strangers. These variables are available in both discrete and continuous formats (i.e., indicating both the existence of giving and the amount given), allowing researchers to use both multivariate probit and multivariate tobit systems (including bivariate models) to study the relationship between religiosity and charitable giving.[20] To align to the bivariate models, this study names giving to religious organizations as religious giving and generates a secular giving measure by summing all non-religious giving (e.g., giving to youth development, education, health services, and human services). Since the survey used the most extensive and detailed method of collecting the data, this study is able to generate estimates

[18] This survey was a random digit dial (RDD) telephone survey conducted by Westat for Independent Sector and provided by the Center on Wealth and Philanthropy at Boston College. Less than 5% of respondents did not answer a question (i.e., a "don't know" or refused response).

[19] The survey respondent was the household head; his/her responses are assumed to represent all household members.

[20] Standard grid-based numerical approximations exist for univariate and bivariate problems, and although the Geweke, Hajivassiliou, and Keane method offers a common approach for simulation-based evaluation of the outcome probabilities in discrete choice models, the computational costs associated with these approaches rise exponentially with dimensionality (Jeliazkov and Lee, 2010). This study initially examined an eight-equation system, for which coefficients and marginal effects of the multivariate probit model were obtained via STATA and R, respectively. However, the marginal effects of the multivariate tobit model could not be calculated due to the difficulty in iteration. Therefore, this study uses bivariate probit and tobit models; future work will focus on using multivariate approaches to investigate these relationships.

of the relationships between household characteristics and giving that are more accurate than those produced through less extensive methods (Bekkers and Wiepking, 2006).[21]

However, the dataset has limitations. First, it does not include the religious affiliation for each respondent. However, religiosity depends only on how religious an individual is, not what type of religion he or she follows; as such, this study investigates the impact of religiosity on charitable giving regardless of the respondent's religious affiliation. Second, the measurement of religiosity is dichotomous. Although it is unfortunate that a fuller scale is not available, a binary measurement of religiosity is still worthy of investigation because this study is able to account for the unobserved individual characteristics that vary between religious and secular giving.[22]

The final sample contains 3,928 observations; 3,356 (85%) of these reported charitable giving in the year when the survey was conducted, with an average level of $3,093. From the raw data, a binary measure of religiosity is constructed based on the respondent's level of religious involvement. The "religious" group includes respondents who report attending religious services every week or nearly every week; the "less-religious" group contains the respondents who report not being active in religious activities and services, including those who attend religious services once or twice a month, a few times a year, or never. The first category contains 43% of respondents (religiosity=1), with the remaining 57% in the less-religious category (religiosity=0).[23] Table 1 shows that 88% of religious people donate to charity, giving an average

[21] Similar to the "method + area" modules in the "Giving in the Netherlands Panel Survey" listed in Bekkers and Wiepking 2006, respondents participating in this survey were given a list of seven methods (payroll, mail, phone, TV or radio request, religious organizations, street collections, and other methods) that could be used to donate money. Respondents indicated whether they donated any money to charity via each method. They were also given a list of sectors (e.g., religious, education, youth development, health, and human services) to which they could donate. Respondents indicated whether their household had donated money to each sector and, if so, how much.

[22] If data is available, future research will study the causal relationship between religiosity and giving using the bivariate (or multivariate) system and a more detailed measure of religiosity.

[23] One limitation of this dataset is that the measure of religiosity is binary (either 0 or 1). A measure of religiosity with various rankings would aid future research.

of $3,719. In contrast, 84% of less-religious people choose to give, with the average total donation being only $2,603.

Table 1. Statistics Description, by Religiosity

Panel A:
Giving by All-respondent Sample and by Religiosity (Percentage)

	All sample (N=3,928)	Religious Sample (N=1,689)	Less-religious Sample (N=2,239)
Total giving	0.8544(0.3528)	0.8805(0.3244)	0.8350(0.3713)
Religious Giving	0.6281(0.4834)	0.9002(0.2998)	0.4259(0.4946)
Secular Giving	0.8651(0.3417)	0.8907(0.3121)	0.8461(0.3610)

Panel B:
Giving by All-respondent Sample and by Religiosity (in Dollars)

	All sample (N=3,928)	Religious Sample (N=1,689)	Less-religious Sample (N=2,239)
Total giving	2,642.59(8,207.85)	3,274.47(8,047.57)	2,173.31(8,295.56)
Religious Giving	868.83(1,949.20)	1,759.66(2,619.65)	264.15(904.24)
Secular Giving	1,967.51(8,083.60)	1,925.40(7,728.83)	1,996.91(8,324.06)

Panel C:
Giving by All-respondent Sample and by Religiosity among Donors (in Dollars)

	All sample (N=3,928)	Religious Sample (N=1,689)	Less-religious Sample (N=2,239)
Total giving	3,093.00(8,801.20)	3,718.77(8,479.59)	2,602.89(9,017.05)
Religious Giving	971.17(2,036.57)	1,849.74(2,654.69)	308.54(970.26)
Secular Giving	2,192.57(8,504.58)	2,039.66(7,940.34)	2,309.10(8,911.08)

Notes: [1.] Standard deviations are in the parentheses.

Since the survey was conducted at the household level, each household is represented by either a male or a female respondent. However, for identifying gender-based differences in charitable giving, the married observations cannot be used. For married respondents, decisions surrounding charitable giving are typically not those of a single individual, since married men and women jointly negotiate charitable giving. Thus, the responses of married respondents are likely to also reflect their spouses' preferences (Andreoni et al., 2003; Yoruk 2009; Li 2014), complicating the identification of gender differences in giving. Following Andreoni et al. (2003), this study thus only uses information from single men and single women to investigate gender-based differences in charitable giving. After the marital status restriction, the subsample used for studying gender differences contains 1,607 individuals, 609 of whom are single men.

Table 2. Giving by gender

	Propensity of giving	Amount of giving	Amount of giving among donors	Giving as a share of income
Men	0.83	1,831	2,209	0.046
Women	0.82	1,671	2,036	0.054
Religious Men	0.90	2,591	2,874	0.068
Religious Women	0.87	2,051	2,354	0.067
Less-religious Men	0.81	1,601	1,983	0.039
Less-religious Women	0.78	1,336	1,722	0.043

Notes: [1.] Amount of giving and the amount of giving among donors are in the level of dollars.

[2.] Propensity of giving and the giving as a share of income are in ratios.

Within this sample, as shown in Table 2, 83% of men and 82% of women give to charity. Among donors, the average amounts given by men and women are $2,209 and $2,036, respectively, representing 4.6% and 5.4% of their respective incomes. Among those who report being actively religious (religiosity=1), 90% of men and 87% of women make charitable donations. The average amount given is $2,874 for male donors and $2,354 for female donors. Among those not actively involved in religious activities (religiosity=0), 81% of men and 78% of women report charitable giving, with average annual donations of $1,983 and $1,722 for men and women, respectively.

The median level of giving among donors is $825 for the full sample, $1,325 for the religious group, and $500 for the less-religious group. The 95th percentile of giving is $9,825 for the full sample, $11,000 for the religious group, and $8,100 for the less-religious group. Based on this, a categorical measure of giving is established: $1–999 is considered low-level giving, $1,000–9,999 is considered mid-level giving, and $10,000 and above is considered high-level giving. With the threshold parameters (i.e., cut points) significant at the 1% significance level, annual donation amounts from single individuals are thus divided into four ordered levels: nothing (g=0); $1–999 (g=1); $1,000–9,999 (g=2); and $10,000 and above (g=3).[24] From Table 3, approximately 18% of respondents report donating nothing.[25] This group may include people who make no charitable contributions regardless of market conditions as well as infrequent donors who donated nothing in the study year but may have donated in the past and may again in the future; some of these are potential donors who would donate if the price of giving to charity

[24] The results vary little if six ranges of giving (zero; $1−499; $500−999; $1,000−3,999; $4,000−9,999; and $10,000 and above) are used. Robustness check results are available upon request.

[25] This is a smaller proportion than the case studied by Harris and Zhao (2007), but this 18% still represents a substantial number of zero observations for the ZIOP model. The superiority of the ZIOP model is shown in Table 6 and discussed in Section V.

fell.[26,27] Table A1 of the appendix describes and provides descriptive statistics for the variables used in the empirical models.

Table 3. Levels of Charitable Giving for Single Individuals

Level of Charitable Giving (g)	Proportion	Standard Error	[95 percent Confidence Interval]	
0	0.1761	0.0095	0.1575	0.1947
1	0.4549	0.0124	0.4305	0.4793
2	0.3416	0.0118	0.3184	0.3648
3	0.0274	0.0041	0.0194	0.0354

Notes: [1.] Nothing (g=0);
$1–999 (g=1);
$1000–9999 (g=2);
$10,000 and above (g=3).

2.4 Analysis: Religiosity and Generosity

2.4.1 Econometric Methodology

To investigate whether more religious people are more generous in terms of higher giving incidences and donation amounts, this study uses the bivariate probit and bivariate tobit models. This circumvents the problem that may arise when using separate probit or tobit models to test whether people with high religiosity are more generous. Separate models ignore the potential correlations among donations to different types of charities from the same individual that are not reflected in observable characteristics (Ramful and Zhao, 2009). Owing to unobserved characteristics, such as individual tastes or attitudes toward money, the probabilities of an

[26] According to Harris and Zhao (2007), some respondents may prefer to identify themselves as non-donors for specific reasons, but this possibility is not considered in the present study.
[27] The price of giving in the literature is defined as one minus the marginal tax rate, but no price of giving is used in this study.

individual giving (and the amount given) to different types of charities are likely related through error terms.

Table 4. Correlations between Religious Giving and Secular Giving

Rho(religious, secular)	Coefficient	Standard Error	t-stat	P-value
Panel A: Bivariate Probit—Propensities of making religious and secular giving				
(Tetrachoric) ρ	0.3967	0.02810	14.118	0.0000
Panel B: Bivariate Tobit—Actual amount of religious and secular giving				
ρ	0.0466	0.0182	2.56	0.0100

Notes: [1.] Test of Ho: the propensity (or, amounts) of religious giving and the propensity of secular giving are independent. [2.] Normality assumption of errors.

Table 4 presents the correlation between the propensity for religious giving and the propensity for secular giving and the corresponding correlation for the donation levels. Both correlations are positive and statistically significant, indicating that the BVP and BVT are appropriate ways to model the interdependence of religious and secular giving. The hypothesis that giving to religious organizations is independent of giving to secular organizations can be rejected at the 1% level (ρ=0.397(0.028), p-value=0.000), suggesting that unobserved individual characteristics that affect an individual's decision to give to religious organizations also affect his/her decision to give to secular causes. Therefore, the BVP system is used when double binary decisions by the same individual are involved.

The general specification for this bivariate binary choice model can be written as

$$y^*_{Religious} = \beta_1 \cdot Religiosity + \theta_1 \cdot Z'_1 + \varepsilon_1$$

$$y^*_{Secular} = \beta_2 \cdot Religiosity + \theta_2 \cdot Z'_2 + \varepsilon_2$$

With $y_{Religious} = \begin{cases} 0 & \text{if } y^*_{Religious} \leq 0 \\ 1 & \text{if } y^*_{Religious} > 0 \end{cases}$, and $y_{Secular} = \begin{cases} 0 & \text{if } y^*_{Secular} \leq 0 \\ 1 & \text{if } y^*_{Secular} > 0 \end{cases}$

where $y^*_{Religious}$ and $y^*_{Secular}$ are the unobserved variables that represent the latent probabilities or incidences that an individual chooses to give to religious and secular organizations, respectively. β_i is the impact of religiosity on charitable giving, and Z_i represents other observed characteristics that are relevant to the decision-making process, including education level and other standard socio-demographic variables such as income, marital status, age, gender, and residence.[28] θ_1 and θ_2 are vectors of parameters of interest. The joint distribution of the error terms ε_1 and ε_2 follows a bivariate normal distribution. The BVT regression, in which the dependent variables are continuous measures of charitable giving to various categories (measured in thousands of dollars), is estimated following a similar procedure to that described for the BVP.[29]

2.4.2 Empirical Results

The impact of religiosity on charitable giving is examined via the BVP model for giving propensity and the BVT model for the donation amount.[30] Table 5 presents the impact of religiosity on religious and secular giving.

[28] Sample statistics for these variables can be found in Table A1 in the Appendix.
[29] Another measure of donation amount is as a share of income (i.e., total donations divided by annual pre-tax income), which takes into account the potential income/wealth gap that may exist by religiosity. However, to be consistent with the literature, this study uses only the donation amount in dollars.
[30] The full regression results from both estimations are presented in the appendix.

The marginal effects from the BVP suggest that religiosity positively influences both types of donations, providing evidence that greater religious involvement increases the likelihood of giving to charity. In addition, the results of the BVT model suggest that a religious individual donates more, on average, than a less-religious individual. These findings are consistent with many previous studies but provide uniquely unbiased and efficient estimates. Interestingly, the impact of religiosity on religious and secular giving is smaller than expected after taking into account the correlation between different types of giving.

Religious people are almost 25% likelier than less-religious people to donate to religious causes, giving $1,029 more annually. Additionally, they are 3% likelier to give to secular causes and donate $446 more per year. Importantly, the effect of religiosity differs between the bivariate systems and the separate models.

For instance, the total marginal effect of religiosity on the propensity for secular giving in the bivariate probit model is only half that of the separate probit models and the estimated impact of religiosity on the propensity for secular giving is 6.3 percentage points higher. Accounting for the correlation between religious and secular giving, this study estimates only a 3% higher chance of secular giving because religiosity has a positive direct effect but a negative indirect effect, and these are entangled when the bivariate probit model is not used. The direct effect of religiosity on the probability of secular giving is 0.048, and the indirect effect (through religious giving) is -0.017. These effects offset each other, yielding a total effect of about 0.03. This therefore indicates that previous studies that do not control for correlations between different types of giving will reach unreliable estimates of the causal effect of religiosity on charitable giving.

Table 5. Impact of Religiosity on Charitable Giving

Panel A:
Probit Specification—Propensities of making religious and secular giving

	Religiosity (higher religious involvement)					
	Single Probit		Bivariate Probit			
	Coefficient	Marginal Effect	Coefficient	Marginal Effect		
				Direct Effect	Indirect Effect	Total Effect
Religious Giving	0.7180*** (0.0434)	0.2658*** (0.0156)	0.7182*** (0.0435)	0.2651*** (0.0160)	-0.0120*** (0.0023)	0.2531*** (0.0159)
Secular Giving	0.3642*** (0.0551)	0.0632*** (0.0098)	0.3623*** (0.0556)	0.0475*** (0.0075)	-0.0170*** (0.0020)	0.0304*** (0.0077)

Panel B:
Tobit Specification—Amounts of religious and secular giving

	Religiosity (higher religious involvement)			
	Single Tobit		Bivariate Tobit	
	Coefficient	Marginal Effect	Coefficients	Marginal Effect
Religious Giving	1.4791*** (0.0952)	0.7170*** (0.0453)	1.3522*** (0.1032)	1.0288*** (0.0979)
Secular Giving	0.9881*** (0.2957)	0.5360*** (0.1599)	0.6969* (0.4050)	0.4458** (0.2247)

Notes: [1.] Standard errors are shown in parentheses. ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively.
[2.] For Bivariate Tobit model, the dependent variable is measured in thousands of dollars. The explanatory variables in the BVP and BVT models are gender, age, race, residency, marital status, education, and family size. The full results for both models are presented in separate tables (A2, A3, A4, and A5) in the Appendix.
[3.] Marginal effects from the BVP model, including direct effects and indirect effects are provided by LimDep. Marginal effects from the BVT model are calculated using Delta Method.
[4.] Direct Effect is the derivatives of $E[y_1|X_1, X_2, y_2 = 1]$ with respect to X_1;
Indirect Effect is the derivatives of $E[y_1|X_1, X_2, y_2 = 1]$ with respect to X_2.
The Marginal Effects is the sum of the two derivative vectors.

After accounting for the correlation between giving to religious and secular causes, religious and less-religious people differ in their behavior surrounding both religious and secular donations (Table 5). Religiosity thus positively affects the likelihood of charitable giving as well as the donation amount. As discussed in Bekkers and Schuyt (2008), charitable contributions to religious causes can largely be explained by the social context created by the religious environment (the "community" explanation), while the internalized social values such as trust, equality, and social responsibility (the "conviction" explanation) explain the secular contributions. Because religious involvement significantly increases donations to both religious and secular causes, the motivation behind this generosity is not limited to a sense of religious duty or the norms of the religious environment. Other factors, such as attitude towards money (Wiepking and Breeze, 2011) and social pressure (Dellavigna et al., 2012) should be considered.

2.5 Analysis: Gender and Generosity

2.5.1 Econometric Methodology

Inspired by Harris and Zhao (2007), this present study supposes that two charitable giving regimes exist. Regime 0 represents non-participants in the charitable giving market, and Regime 1 represents participants. Let the binary variable τ denote the division between these two regimes. In other words, $\tau = 0$ represents non-participants, while $\tau = 1$ represents participants, including donors who give positive amounts to charity, and donors who currently give nothing to charity but may give to charity under the right market conditions.

The participation model (also known as the split probit model), which analyzes the dichotomous decision of individuals to participate in charitable giving activities, can be written as

$$\tau^* = z'\gamma + \varepsilon$$

where the latent variable τ^*, which is the first underlying latent variable in the whole data-generating process, represents the propensity for participation, vector z represents the factors that affect the participation decision, vector γ represents the unknown coefficients, and ε is the standard normally distributed error term. As pointed out by Harris and Zhao (2007), the mapping between τ^* and τ is given by

$$\tau = \begin{cases} 0 & \text{if } \tau^* \leq 0 \\ 1 & \text{if } \tau^* > 0 \end{cases}$$

The probability of an individual being in Regime 1 is given by (Maddala 1983)

$$\text{Prob}(\tau = 1|z) = \text{Prob}(\tau^* > 0|z) = \Phi(z'\gamma)$$

Accordingly, the probability of an individual falling into Regime 0 is

$$\text{Prob}(\tau = 0|z) = \text{Prob}(\tau^* \leq 0|z) = 1 - \Phi(z'\gamma)$$

where $\Phi(\cdot)$ is the standard normal cumulative distribution function.

Assume participation status is conditioned on $\tau = 1$; thus, different participation levels can be represented by a consumption model (also known as the ordered probit model):

$$\tilde{g}^* = x'\beta + \mu$$

In this consumption model, $\tilde{g}^*$ is the underlying latent variable of $\tilde{g}$, which is an ordered discrete variable generated by the so-called ordered probit model. Note that $\tilde{g}$ is related to its latent dependent variable $\tilde{g}^*$ by the following mapping (Harris and Zhao 2007):

$$\tilde{g} = \begin{cases} 0 & \text{if } \tilde{g}^* \leq 0 \\ 1 & \text{if } \delta_0 < \tilde{g}^* \leq \delta_1 \\ 2 & \text{if } \delta_1 < \tilde{g}^* \leq \delta_2 \\ 3 & \text{if } \delta_2 \leq \tilde{g}^* \end{cases}$$

The vector *x* in the consumption model represents the explanatory variables that determine the various levels of donations once people choose to contribute.[31] The vector β contains the unknown coefficients and μ is the standard normally distributed error term. δ is the vector of boundary parameters that are estimated together with the vector of unknown parameters β.[32]

The probability of a particular level of charitable giving, under the ordered probit model, can then be written as (Maddala 1983)

$$\text{Prob}(\tilde{g} = j | x, \tau = 1) = \Phi(\delta_j - x'\beta) - \Phi(\delta_{j-1} - x'\beta)$$

$$\text{where } j \in [1, \ J-1]$$

When people decide to give to charity, the decisions on whether to give and how much to give are made jointly. This implies that the parameters τ and $\tilde{g}$ cannot be observed individually in terms of a zero donation, as described earlier. In this case, as pointed out by Harris and Zhao (2007), τ and $\tilde{g}$ can only be observed by using the following criteria:

$$g = \tau * \tilde{g}$$

Therefore, we can derive that

$$g = x'\beta + \mu$$

$$g = \begin{cases} 0 & \text{if } \tilde{g} \leq 0 \quad \text{or} \quad \tau = 0 \\ 1 & \text{if } \delta_0 < \tilde{g} \leq \delta_1 \quad \text{or} \quad \tau = 1 \\ 2 & \text{if } \delta_1 < \tilde{g} \leq \delta_2 \quad \text{or} \quad \tau = 1 \\ 3 & \text{if } \delta_2 \leq \tilde{g} \quad \text{or} \quad \tau = 1 \end{cases}$$

[31] The vectors *x* and *z* defined previously may differ since there is no requirement that the *x* vector equals the *z* vector.

[32] Following Harris and Zhao (2007), μ_0 is assumed to be zero throughout the analysis.

If, for now, we assume that the two error terms ε and μ from the participation model and the consumption model are uncorrelated, then the full probabilities for the observed donation g of the ZIOP model can be written as (Harris and Zhao 2007)

$$\text{Prob}(g) = \begin{cases} \text{Prob}(g = 0|x, z) = \text{Prob}(\tau = 0|z) + \text{Prob}(\tau = 1|z) * \text{Prob}(\tilde{g} = 0|x, \tau = 1) \\ \text{Prob}(g = j|x, z) = \text{Prob}(\tau = 1|z) * \text{Prob}(\tilde{g} = j|x, \tau = 1) \\ \text{Prob}(g = J|x, z) = \text{Prob}(\tau = 1|z) * \text{Prob}(\tilde{g} = J|x, \tau = 1) \end{cases}$$

$$\text{where } j \in [1,\ 3]$$

which is,

$$\text{Prob}(g) = \begin{cases} \text{Prob}(g = 0|x, z) = [1 - \Phi(z'\gamma)] + \Phi(z'\gamma) * \Phi(-x'\beta) \\ \text{Prob}(g = j|x, z) = \Phi(z'\gamma) * [\Phi(\delta_j - x'\beta) - \Phi(\delta_{j-1} - x'\beta)] \\ \text{Prob}(g = J|x, z) = \Phi(z'\gamma) * [1 - \Phi(\delta_{J-1} - x'\beta)] \end{cases}$$

$$\text{where } j \in [1,\ 3]$$

In the next step, this study uses the maximum likelihood estimation to estimate the unknowns. Thus, the related log likelihood function can be written as (Harris and Zhao 2007)

$$\ell(\theta) = \sum_{j=0}^{J} I_j \ln[\text{Prob}(g = j|z, x, \theta)]$$

where $I(\cdot)$ is the indicator function, which equals 1 if an individual chooses to contribute at level j (j=0, 1, 2, 3) and 0 otherwise.

2.5.2 Empirical Results

In this section, the analysis adds to the literature on gender differences in charitable giving by explicitly investigating the role of religiosity. Using the ZIOP approach, the results demonstrate that previous empirical studies have masked important differences among donor groups with different levels of religiosity. The superiority of using the ZIOP model in this study can be examined by various tests (e.g., LR, Vuong non-nested test, Hausman, a small Monte

Carlo simulation using the data, and information criteria).[33] Table 6 compares the information criteria between the traditional ordered probit (OP) model and the ZIOP. The information criteria (AIC, BIC, and HQIC) consistently indicate that the ZIOP model is a better fit than the OP model.

Table 6.
Information Criteria Comparison between OP Model and ZIOP Model

	OP	ZIOP
μ 1	1.3565***	2.9201***
μ 2	3.1107***	4.8843***
log likelihood	-1706.85	-1571.54
Info. Criterion AIC	2.1405	1.9895
Finite Sample AIC	2.1406	1.9901
Info. Criterion BIC	2.1840	2.0799
Info. Criterion HQIC	2.1566	2.0230

Notes: [1.] ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively. [2.] μ 1 and μ 2 are threshold parameters.

As mentioned by Harris and Zhao (2007), the marginal effects of the ZIOP model combine the effects of the participation decision with those of the donation amount. Marginal effects that consider the "zeroes" coming from two different sources—non-participation and current zero donation—are presented for both the overall estimation and the subsample estimations.[34]

[33] The author thanks Mark Harris for suggesting these tests for the superiority of the ZIOP model.
[34] The ZIOP model assumes that the error terms from the two-stage models are uncorrelated, whereas the ZIOP model with correlation (ZIOPC model) assumes correlated disturbances. The results of this study indicate that both the ZIOP model and the ZIOPC model are superior to the OP model in terms of most of the criteria. Moreover, based on the AIC, BIC, and HQIC, the results consistently suggest that the ZIOP is a slightly better fit than the

Table 7 shows that charitable giving behaviors are not widely different between men and women, regardless of religiosity. In general, men are only 0.9% likelier than women to make small donations; in contrast, women are slightly more likely than men to make medium and large donations. None of these differences are statistically or economically significant: there are essentially no differences in the propensity of men and women to give to charity. To consider whether this changes when taking religiosity into account, religious and less-religious groups must be examined separately.

2.5.2.1) Religious Men and Women (Religiosity=1)

In using the ZIOP model, this study assumes that men's and women's charitable giving decisions result from two distinct decisions: participation and level of giving, conditional on participation. These decisions can show opposite effects. For instance, religious men are 2.4% likelier than religious women to not participate in philanthropy; however, conditional on participation, religious men are slightly (0.2%) *less* likely than religious women to donate nothing. Those effects balance to yield a 2.2% higher chance of religious men reporting no donations to charities. Panel B of Table 7 reports that, considering low-level donations, religious men are 1.8% likelier to give than religious women. Although this difference is statistically significant, it is not significant from an economic standpoint. Additionally, when making both mid- and high-level donations, religious men and women behave identically in terms of giving propensity.

ZIOPC, even though their performance is similar. Therefore, only the results from the ZIOP regressions are shown and discussed in this paper. Additional results are available from the author upon request.

Table 7. Gender difference (Men vs. Women) in Propensity to Give—Marginal Effects

Panel A:
Zero Observations (including permanent and current non-givers) : g=0

	Zero-Inflated Ordered Probit (ZIOP) Model		
	Non-participants Therefore Donate Zero	Participants Donate Zero Amount Due to Current Market Conditions	Full Zero Observations
	Pr (τ=0)	Pr (τ=1,$\tilde{g}$=0)	Pr (g=0)
All Sample	0.0073	0.0009	0.0081 (0.0088)
Religious Group	0.0236	-0.0017	0.0219* (0.0125)
Less-religious Group	-0.0316	-0.0224	-0.0540*** (0.0099)
Number of Observations			3,928

Panel B:
Positive Observations (including three levels of giving: $1–999 (g=1); $1000–9999 (g=2) ; $10,000 and above (g=3))

	Prob (g=1) *g=1 if $1–999*	Prob (g=2) *g=2 if $1,000–9,999*	Prob (g=3) *g=3 if over $10,000*
All Sample	0.0091 (0.0075)	-0.0045 (0.0116)	-0.0002 (0.0014)
Religious Group	0.0178*** (0.0007)	-0.0058 (0.0195)	0.0002 (0.0027)
Less-eligious Group	-0.0599*** (0.0231)	0.0350*** (0.0129)	0.0027* (0.0015)
Number of Observations	3,928	3,928	3,928

Notes: [1.] Dependent Variable: Propensity to Give to Ordered Levels of Giving. Independent Variable of Interest: Gender (=1 if Males) [2.] Standard errors are shown in parentheses. ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively. [3.] The explanatory variables in the traditional probit and ZIOP models are gender, age, race, residency, marital status, education, family size, attitude towards money, and confidence in charitable organizations. The full results for both models are presented in separate tables (A6, A7, and A8) in the Appendix.

2.5.2.2) Less-religious Men and Women (Religiosity=0)

The difference in giving is larger between less-religious men and women. Compared with less-religious women, less-religious men are 3.2% more likely to participate in philanthropy; when they participate, they are 2.2% more likely to make a non-zero donation. These two effects reinforce each other so that, for the less-religious donor group, women are 5.4% likelier to report zero giving to charity. This gender difference is larger than that in the religious group, in which men are 2.2% likelier than women to give nothing. Additionally, less-religious men and women show an opposite tendency than their religious counterparts in terms of zero donations, with women being more likely to give nothing.

Less-religious men and women also behave differently than religious men and women in terms of low-level giving. Among highly religious people, men are 1.8% more likely to make small donations than women; in contrast, among less-religious people, women are 6% more likely to make small donations than men. In addition, although when making mid- and high-level donations, highly religious men and women behave similarly, the gender difference in the propensity to give to charity among less-religious individuals is statistically and economically significant. Panel B of Table 7 shows that less-religious men are 3.5% more likely to make mid-level donations and 0.3% likelier to make large donations than less-religious women.

In sum, less-religious women are likelier to make low-level donations to charities. In contrast, less-religious men are less likely to donate nothing and in general have higher propensities to give both at both middle and high levels.

2.6 Discussion and Policy Implications

This study examines the impact of religiosity on generosity and empirically examines whether there are any gender-based differences in this. From a methodological standpoint, this study used bivariate probit and bivariate tobit models to control for the potential correlation between religious and secular giving owing to unobserved individual characteristics, thereby addressing the problem of inefficient estimates found in previous studies. Moreover, this study is the first to use a zero-inflated ordered probit model to distinguish the decision to participate in philanthropy and the donation level; this reduces the potential bias caused by treating decisions on charitable giving indifferently. In addition, to investigate the causal relationship between religiosity and charitable giving, this study added a theoretical framework to the existing literature.

This study has two main results. First, religious people are more generous charitable givers: they have a greater propensity to give as well as higher levels of charitable giving to not only religious but also secular organizations. These findings are consistent with previous studies but provide uniquely unbiased and efficient estimates. The bivariate systems permit a test of the correlation across the different giving decisions, and the correlation between religious and secular giving is highly significant. After controlling for this correlation, the impacts of religiosity on religious and secular giving are smaller than expected. Second, highly religious men are 1.8% likelier to make small donations than highly religious women. However, highly religious men and women show no differences in terms of the probability of making medium- and large-sized donations. In contrast, less-religious women show a greater propensity (6%) to make small donations than their male counterparts, whereas less-religious men are more likely to make medium- and large-sized donations than their female counterparts.

These findings have certain implications for policymakers and fundraising organizations. Gender differences exist in the propensity to give when religiosity is taken into account. Since there are opposite gender-based differences for religious and less-religious individuals, charitable organizations can consider tailoring different fundraising plans. To attract more givers, charitable organizations could specifically solicit donations from highly religious men and less-religious women.

CHAPTER 3

CHARITABLE GIVING BY MARRIED COUPLES: WHO IS PREVAILING IN THE BARGAINING?

3.1 Charitable Giving Decision-making in Households

Traditional models of family behavior are unitary--households are assumed to maximize the household's utility function subject to its budget constraint. However, husbands and wives, both as individuals, have preferences over the allocation of resources within households. This correspondingly results in household bargaining in a manner of jointly deciding the allocation of resources (Pollak, 2005). A large body of research has focused on how married couples make financial decisions through household bargaining. Theoretical examples include Manser and Brown (1980), Lundberg and Pollak (1993), and Volger et al. (2006); on the other hand, typical empirical examples include Thomas (1990), Lundberg and Pollak (1996), and Browning and Chiappori (1998). However, little is known about the bargaining over decisions to give to charities within families. Who has relatively more bargaining power when the husband and the wife make joint decisions on donations? Does intra-household bargaining over charitable giving increase or reduce the amount of charitable contributions since bargaining can create either positive or negative externalities? Do gender roles matter? Most research on charitable giving assumes that decisions on charitable giving are a household's decision that is unitary rather than

an individual's decision. This is likely too strong an assumption, however (Samuelson, 1956).[35]

As a husband and the wife decide jointly over most household outcomes (e.g. new purchases, stock investments, and donations to charities), A household's decision is normally made through bargaining, and the bargaining process depends on the balance of bargaining power between the husband and the wife. Essentially, household bargaining in general relies on gender differences in utility functions of the husband and the wife, and bargaining would be unnecessary otherwise (Addoum and Kung, 2011). Extensive literature examines gender-based differences in giving to charities. Andreoni et al. (2001), Rooney et al. (2005), Mesch et al. (2006, 2011), and Piper and Schnepf (2008) find evidences of males and females having their own giving preferences and habits. Andreoni, Brown, and Rischall (2003) suggest that when a couple has exactly identical preference towards a type of giving, donations to that type of giving would bring utility to both partners. Conversely, when a couple has perfectly opposing tastes in giving, each dollar given by a partner to a type of charity would create negative externalities experienced by the other partner. The negative externality is hence very likely to reduce donations. It is likely that a couple in marriages has greater similarity because marriage is assortative across factors such as education and religious faith. But household bargaining will exist in giving unless the couple's tastes over giving are identical, and this bargaining is expected to be costly.

According to Andreoni et al. (2003), the costly bargaining can be inframarginal. In this case, the couple might have conflicts in deciding whether or not to give to certain charities. The cost can also be marginal, for example, the cost can occur when deciding how much to give. Both types of costs potentially reduce the charitable giving by a household. Nonetheless,

[35] Because individuals within households have preferences, so aggregating individuals' preferences into preferences of households leads to social choice problem (Samuelson, 1956).

bargaining is possible to be beneficial, and such a bargaining could save some time or costs associated with identifying where to donate, and whether and how much to donate.[36]

The results from the research existing on the intra-household bargaining over giving to charities are mixed. Using two-year pooled cross-sectional data, Andreoni, Brown, and Rischall (2003) investigate the intra-household decision-making over charitable giving.[37] Comparing households in which the husband and the wife decide jointly on charitable giving with those in which couples relying on a sole decision-maker, Andreoni et al. (2003) show that household bargaining decreases the amount of charitable giving by 6% and the husband has higher decision-making authority. The result of decrease in giving therefore indicates gender-based difference in giving preferences within households. In contrast, Yoruk (2009) replicates the study of Andreoni et al. (2003) using a cross-sectional dataset from Panel Study of Income Dynamics (PSID) and finds contrary results.[38] His study presents evidence that bargaining increases the amount of charitable giving by 7% and the wife has relatively higher bargaining power than the husband. This result indicates couples having identical giving preference. In sum, the question of how married couples make charitable donations through household bargaining process is far from clear.

There might be several possible reasons for the mixed results. First, previous studies use either the pooled cross-sectional or cross-sectional data under the very restrictive assumption that

[36] Andreoni et al. (2003) suggest that when the couple's preferences are identical, giving by the couple could be below the simple sum of giving amounts by both partners according to Samuelson efficiency conditions, and giving by the couple could possibly be above the simple sum of giving amounts by both partners because of the pushing-up "income effect".

[37] In their study, Andreoni et al. (2003) use U.S. household survey conducted independently in 1992 and 1994 by the Gallup Organization, and commissioned by Independent Sector. Pooling the two independent cross-sectional datasets gives them a sample of 4,180 households. Both the 1992 and 1994 survey include a question on who allocates money to charities in the household.

[38] In conducting a cross-sectional study, Yoruk (2009) uses the 2003 wave of data extracted from the Center on Philanthropy Panel Study, the Philanthropy Module of the PSID. The 2003 wave of the survey data contains information on giving and volunteering for a sample of 7,822 U.S. households. Particularly, the 2003 survey includes information on who is the primary decision-maker in the household to decide charitable donations.

there are no unobserved individual effects. However, failure to adequately control for certain unobserved characteristics may cause biased estimators. For example, the husband or the wife with relatively higher persuading ability would be more likely to be a decision maker in a household. An individual's persuading ability, however, cannot be observed.[39] In this case, a study using a single cross section (e.g. Yoruk (2009)) or just a pooling of the cross sections (e.g. Andreoni et al. (2003)) will produce biased and inconsistent estimators. This study attempts to reduce, if not eliminate, such bias and inconsistency by using a longitudinal dataset. In addition, the quality of the survey data used in this study is superior to other frequently-used household surveys of giving. For instance, compared with the dataset used by Andreoni et al. (2003), the dataset from the Center on Philanthropy Panel Study used in this study not only has a larger sample size but has no problem of missing data (Wilhelm, 2006).

Second, this study provides new insights into the question of who is prevailing in the intra-household bargaining over charitable giving by investigating how the theory of traditional views on gender roles may influence jointly-deciding charitable giving. Traditional views on gender roles are generally the attitudes that men are providers and women are homemakers. According to such a theory, households that hold strict traditional views on gender roles are expected to be husband-deciding families. By contrary, households that have relatively less or no traditional views on gender roles are likely to be more egalitarian, in which case men and women are equal in all domains (Helmreich, Walster, and Gibson, 1982; Claffey and Mickelson, 2009) Therefore, couples belonging to a more conservative religious denomination have a higher incidence of having the husband decide on the household's charitable giving (Wiepking and Bekkers, 2010). It is reasonable to hypothesize that husbands in the strict conservative religious

[39] One's persuading ability is unlikely to change over two-year period, and thus one's persuading ability will be controlled using the fixed effect approach.

households have higher decision-making authorities than the husbands in less (or no) conservative religious households. Correspondingly, the hypothesis in this study is that husbands in the strict Protestant households are expected to have higher decision-making power over charitable giving, compared with the husbands in the less-strict Protestant or non-Protestant households.

To preview, the empirical findings of this study contrast with those of Yoruk (2009) but support the conclusion of Andreoni et al. (2003); Results show that bargaining over charitable giving reduces household giving and married households give to charity in favor of the husband's preferences. The reduction of charitable giving when couples make joint decisions implies that household bargaining is costly.[40] Donations that favorites one spouse creates negative externalities experienced by the other. Additionally, the evidence of this study shows the joint decision made by a family with traditional views on gender roles tends to have the husband with more bargaining power.

The next two sections present the data and the identification strategy. The subsequent analysis has three parts. First, results show evidence of gender differences in giving between single males and single females, as well as married couples (husband-deciding couples, wife-deciding couples, and jointly-deciding couples). Second, evidence is provided on whether household bargaining increases or decreases charitable giving, and which gender is prevailing in the bargaining process. Third, evidence on differences of bargaining power within households from the prospective of the theory of traditional gender roles is explored.

[40] When bargaining is costly, it indicates that tastes are not identical between the couple. According to Andreoni et al. (2003), the cost can be inframarginal. In this case, the couple might have conflicts in deciding whether or not to give to certain charities. The cost can also be marginal, for example, the cost can occur when deciding how much to give. Both types of costs potentially reduce the charitable giving by a household.

3.2 Data

This study uses longitudinal surveys of U.S. households in 2003 and 2005 by the Center on Philanthropy Panel Study (COPPS hereafter), the Philanthropy Module of the PSID.[41] Both the 2003 and 2005 waves of data contain extensive information on charitable giving in regards to different categories, such as demographics, health status, religious affiliation, and economic variables for both the head of the household and the spouse.[42] Table A9 of the appendix describes the variables used in the empirical models.[43] Particularly, a unique feature of the survey is that it includes crucial information on "Who Decides" to give to charities within a family. Questions asked regarding this issue are: "who in your family was involved in decisions about how much support to give individual charities;" and "when you and your spouse made decisions about supporting charities jointly, did one of you make most of the decision, did your mostly decided together, or did you each make your own separate decisions?"

Since the dataset contains information on household level, and in order to investigate gender differences in charitable giving of singles and couples separately, the COPPS sample is parsed into singles and couples (i.e. married couples and couples living together). The singles includes 6,412 observations, 2,065 of whom are single males and 4,347 are single females. For single males 48.5% gave to charities during the interviewed years, and the average amount they

[41] The 2001, 2007, and 2009 waves were not chosen to merge to the panel because those waves do not include information about decision making authority. The 2011 and 2013 waves are not available yet.

[42] As has often been noted, non-response can be a serious problem in survey data. However, missing data is scarce in the COPPS data. Wilhelm (2007) suggests that the quality of the giving data from COPPS is superior to other major frequently-used household surveys of giving, such as the five frequently-used household surveys of giving: Giving and Volunteering; The General Social Survey; Giving and Volunteering in California; Canada's Survey of Giving; and The 1974 National Study of Philanthropy. For example, 35% of the Giving and Volunteering respondents have missing data in one or more of the questions about giving toward disaggregated purposes; in contrast, only 1% of the COPPS respondents have any missing giving data (Wilhelm 2006). Giving and Volunteering is widely used by many researches on giving, such as the study by Andreoni, Brown, and Rischall, 2003.

[43] The survey does not report the marginal tax rate for each household. Following Andreoni et al. (2003); and Yoruk (2009), the tax price of giving is calculated as 1 for households with no itemization and (1-marginal tax rate) for households itemizing deductions. The marginal tax rate for each household is calculated using information on filing status (i.e. single, head of household, married filing jointly, married filing separately), federal tax schedules, income, number of dependents under age 18, and number of household members.

gave is $588 as shown in Table 8. In contrast, 50.8% single females were donors, and single females gave $596 on average. Generally, the average amount of donation from singles females was higher compared with the average amount that single males gave. In addition, relative to their incomes, single females also gave a larger share of their income to charities. Single males donated 1.8% of their income to charity, whereas single females gave 2.5% of their income to charity.

Following Brown, Einolf, and Wilhelm (2013), the couples sample is further parsed into husband-deciding couples, wife-deciding couples, and jointly-deciding couples in order to investigate different charitable giving preferences of husbands and wives.[44][45] Husband-deciding couples (n=1,168) donated $2,143, which was 2.9% of their household income. Wife-deciding couples (n=1,793) donated $1,789, and it averaged 2.3% of their household income. Jointly-deciding couples (n=2,833) donated $2,653, and was 5.2% of household income. The sample statistics are generally consistent with those presented in Yoruk (2009). The average donation by husband-deciding couples is much higher than the wife-deciding couples. Joint-deciding couples on average give more to charity compared with either the husband-deciding couple or the wife-deciding couples. Additionally, joint-deciding couples give about 3 percentages more of their income to charities compared with husband-deciding couples and wife-deciding couples.

[44] The sole decision-maker has the advantage for that individual of yielding donations in favor of his/her giving preference, although his/her spouse's time could be involved in deciding donations. Donations from jointly-deciding couples are yielded in a manner that is a microcosm of household bargaining outcome (Brown, 2000).

[45] Given the survey questionnaire, after excluding married households that involve other charitable giving decision-makers (i.e. father Jim, or son John), married couples can be categorized into four groups: husband-deciders (1,168), wife-deciders (1,793), joint-deciders (2,833), and separate-deciders (640). The household characteristics of these groups are consistent with the sample characteristics presented in Andreoni et al. (2003) and Yoruk (2009). In Andreoni et al. (2003), 19% of the couples are husband-deciders, 29% are wife-deciders, and 52% decide jointly. In Yoruk (2009), 14% of the couples are husband-deciders, 26% are wife-deciders, 51% are joint-deciders, and 9% are separate-deciders. In this study, 18% of the couples are husband-deciders, 28% are wife-deciders, 44% are joint-deciders, and 9.9% are separate-deciders.

Table 8. Donations by Marital Status and by Decision-Making Authority

	All sample	Single Males	Single Females	Husband-deciding	Wife-deciding	Jointly-deciding
Donations in dollars						
Mean	1,189	588	596	2,143	1,789	2,653
Standard deviation	3,169	2,306	1,671	4,354	4,073	4,461
Donations as a percentage of household income						
Mean	2.50%	1.80%	2.53%	2.9%	2.3%	5.2%
Standard deviation	0.25	0.09	0.14	0.06	0.04	0.54
Observations	16,030	2,065	4,347	1,168	1,793	2,833

Notes: [1.] Single sample is parsed into single males and single females.
[2.] Couples sample includes husband-deciding households, wife-deciding households, and jointly-deciding households.

3.3 Estimation Methodology

3.3.1 Gender differences

To see the existence of intra-household bargaining between the husband and the wife, this study looks for gender differences in the decision to give to charities. By investigating the probability of giving by each group and the dollar amount of giving by each group, this study looks for gender differences in the decision to give between the single males and the single females as well as comparing the giving patterns among the husband-deciding couples, the wife-deciding couples, and the jointly-deciding couples.

The general specification for the panel probit model can be written as

$$g_{it}^{*} = \beta X_{it} + \varepsilon_{it}, \quad t = 1,2, i = 1, \dots, N.$$

$$\text{With } g_{it} = \begin{cases} 0 & \text{if } g_{it}^{*} \leq 0 \\ 1 & \text{if } g_{it}^{*} > 0 \end{cases}$$

where g_{it}^{*} is the unobserved variable that represents the latent probabilities or incidences that a household chooses to give to charity. X_{it} represents the observed characteristics that are relevant to the decision-making process, including education level and other standard socio-demographic variables such as family income, health status, age, employment status, and residency.[46] β is the vector of parameters of interest. t and i represent the year and household units, respectively. The panel tobit model regression, in which the dependent variable is continuous measure of charitable giving is estimated following a similar procedure to that described for the panel probit model.

[46] Descriptions for these variables can be found in Table A9 in the Appendix.

3.3.2 Joint Decision-making: Influence of bargaining on charitable giving

Following Anreoni, Brown, and Rischall (2003), this study estimates giving choices by jointly-deciding couples as a linear combination of the amount the husband would choose if he were the sole decision-maker, and the amount the wife would choose if she were the sole decision-maker on charitable giving.

The level of charitable giving by the household can be expressed as

$$G = I_h \cdot G_{husband} + I_w \cdot G_{wife} + I_j \cdot G_{jointly} \ . \quad (1)$$

Where I_h and I_w are indicator dummies equal to one if the husband or the wife is the decision-maker, respectively. I_j is an indicator dummy which is equal to one when the couple makes charitable giving decision jointly. Equation (1) can be rewritten as

$$G = I_h \cdot AX_h + I_w \cdot BX_w + I_j \cdot (\theta_h AX_h + \theta_w BX_w)$$

$$=(I_h + I_j\theta_h)AX_h + (I_w + I_j\theta_w)BX_w. \quad (2)$$

Let X_h be the vector of controlled variables when the husband is the decision-maker and the vector A be the associated coefficients. Similarly, X_w is the vector of variables being controlled in the estimation when the wife makes decision and B is denoted as the vector of coefficients from the estimation. The parameters θ_h and θ_w are defined as the weights of how the couple's giving decision is influenced by preferences of the husband and the wife separately. Therefore, the predicted household level of charitable giving will be $G = AX_h$ when the husband is the decision-maker; the predicted giving will be $G = BX_w$ when the wife has the decision-making authority, and household giving to charity will be $G = \theta_h AX_h + \theta_w BX_w$ if the husband and the wife make charitable giving decisions together.

More specifically, the amount of donations if the husband is the sole decision-maker can be estimated by

$$G_{husband} = AX_h + \varepsilon_h = \alpha_1 x_{1h} + \alpha_2 x_{2h} + \cdots + \alpha_k x_{kh} + \varepsilon_h. \quad (3)$$

The amount of donation if the wife is the sole decision-maker can be estimated by

$$G_{wife} = BX_w + \varepsilon_w = \beta_1 x_{1w} + \beta_2 x_{2w} + \cdots + \beta_k x_{kw} + \varepsilon_w. \quad (4)$$

If the husband and the wife make charitable giving decisions together, their giving behavior can be estimated by the following equation

$$G_{jointly} = \gamma_1 x_{1h} + \gamma_2 x_{2h} + \cdots + \gamma_k x_{kh} + \delta_1 x_{1w} + \delta_2 x_{2w} + \cdots + \delta_k x_{kw} + \varepsilon_j$$

$$= \Gamma X_h + \Delta X_w + \varepsilon_j = \theta_h AX_h + \theta_w BX_w + \varepsilon_j$$

Which is, $\widehat{G_{jointly}} = \theta_h \widehat{G_{husband}} + \theta_w \widehat{G_{wife}} + \varepsilon_j. \quad (5)$

From equation (5), this study follows Andreoni et al. (2003) and Yoruk (2009) and estimats the amount of charitable giving by jointly-deciding couples as a linear combination of the levels of donations that would have been chosen by the giving preferences of husband and the wife if each were the sole decision-maker. In this case, the parameters θ_h and θ_w are hence interpreted as the weights of how the couple's giving decision being influenced by preferences of the husband and the wife separately.

Therefore, the husband has greater bargaining power than the wife when $\theta_h > \theta_w$, and the wife has relatively greater bargaining power when results show $\theta_h < \theta_w$. In addition, as indicated by Andreoni et al. (2003), parameters θ_h and θ_w are scalars and are not constrained by any conditions. Thus the sum of θ_h and θ_w can help us answer the question of whether intra-household bargaining increases or decreases the level of household charitable giving. Specifically, if

$\theta_h + \theta_w > 1$	Bargaining can increase household charitable giving
$\theta_h + \theta_w < 1$	Bargaining can decrease household charitable giving
$\theta_h + \theta_w = 1$	Bargaining has no impact on household charitable giving.

3.4 Results: Gender Differences and Influence of Household Bargaining

3.4.1 Gender Differences

3.4.1.1) Single Males and Single Females

The probabilities of giving to charities for single males and single females are examined in this section by using the panel probit model. The first two columns in Table 9 show the estimation of the probability of giving to charities by single males and single females, and the results shown in the last two columns are from tobit estimation on the level of donation by each sex.

Marginal effects from the probit specification shown in Table 9 indicate that tax price of giving is not significantly different from zero for either group. Household income, however, has significant positive impacts on the likelihood of giving to charities for both single males and single females. Additionally, age, education, attending churches, and health status significantly and positively influence the probability of giving for both groups. Being Hispanic plays a negative role to decide whether to give or not for only single males. In contrast, religious affiliation and employment status have significant impacts on the probability of giving for only single females.

Comparing single males and single females giving patterns, Table 10 shows that the hypothesis that the decision to give by single males and single females are the same can be rejected at the 10% level of significance ($\chi^2(13) = 21.48, p\ value = 0.06$). It suggests that the probability of whether to give to charities can be significantly different between single males and single females.

Table 9. Probability of Giving and Total Contributions to Charity, by Singles

	Probability of Giving (Probit)		Amount of Total Contributions (Tobit)	
	Single Males	Single Females	Single Males	Single Females
Ln(price of giving)	-0.5291(0.3579)	-0.0589(0.1309)	-2.8517(1.4337)**	-0.5332(0.5736)
Ln(family income)	0.1086(0.0200)***	0.1140(0.0141)***	0.4939(0.0801)***	0.5882(0.0558)***
Age	0.0068(0.0009)***	0.0085(0.0007)***	0.0308(0.0034)***	0.0388(0.0023)***
High school grads	0.0433(0.0356)	0.0699(0.0225)***	0.2221(0.1469)	0.3274(0.0987)***
Attended college	0.1142(0.0369)***	0.1776(0.0246)***	0.6212(0.1632)***	0.8870(0.1163)***
College grads	0.2595(0.0367)***	0.2893(0.0266)***	1.1897(0.1874)***	1.5178(0.1555)***
Hispanic	-0.1207(0.0625)*	-0.0639(0.0436)	-0.6349(0.2063)***	-0.2577(0.1736)
Church goer	0.3194(0.0244)***	0.2212(0.0192)***	1.5472(0.1109)***	1.1265(0.0711)***
Health	0.1065(0.0355)***	0.1112(0.0225)***	0.3699(0.1317)***	0.4962(0.0859)***
Employed	-0.0059(0.0350)	0.0801(0.0230)***	0.0448(0.1356)	0.3444(0.0922)***
Protestant	-0.0140(0.0270)	-0.0364(0.0201)*	-0.0321(0.1035)	-0.0771(0.0820)
Urban	0.0253(0.0306)	0.0256(0.0211)	0.1809(0.1153)	0.1538(0.0844)*
Observations	1,901	3,993	1,901	3,993

Notes: [1.] Standard errors are shown in parentheses.
[2.] *** indicates significance at 1% level, ** at 5% level, and * at 10% level.
[3.] Total contributions are measured in the natural log form.

Table 10. Test of Structural Stability, by Singles

Hypothesis: charitable giving equations of the pairwise groups are the same.

	Probit		
	single males	single females	single households
log-likelihood	-1050.14	-2285.69	-3346.57
$LogL_{ur}$(unrestricted)	-3335.83		
$LogL_r$ (restricted)	-3346.57		
χ^2 (chi-squares)	2*[-3335.83-(-3346.57)]=21.48		

	Tobit		
	single males	single females	single households
log-likelihood	-3387.37	-7457.59	-10854.84
$LogL_{ur}$(unrestricted)	-10844.96		
$LogL_r$ (restricted)	-10854.84		
χ^2 (chi-squares)	2*[-10844.96-(-1085484)]=19.76		

Summarized Results of Coefficient Comparisons

	Probit singles (d.f.=13) single males and single females	Tobit singles (d.f.=13) single males and single females
chi-squares	21.48*	19.76*
p-values	0.06	0.1

Notes: [1.] Steps of calculating chi-squares to test the structure stability:

[1)] Fit the same model in each subsample

[2)] Calculated the unrestricted log likelihood is the sum of the subsample log likelihoods: $LogL_{ur}$= ($LogL_{single\ males}$)+ ($LogL_{single\ females}$)

[3)] Pool the subsamples, and fit the model to the pooled sample

[4)] Restricted log likelihood is that from the pooled sample: $LogL_r$

[5)] $\chi^2 = 2 * (LogL_{ur} - LogL_r)$

degrees of freedom = (K-1)*model size.

[2.] *** indicates significance at 1% level, ** at 5% level, and * at 10% level.

Results shown in Table 9 revealed that the giving patterns of the levels of charitable giving for single males and single females are mainly consistent with the patterns of giving probability for both groups. Marginal effects indicate that household income, age, education, attending churches, and good health positively and significantly affect the dollar amount of giving by both single males and females. However, single males are significantly sensitive to the tax price of giving. For example, if the tax price increases 1%, single males will lower their donation by 2.9% on average. Moreover, single females are significantly influenced by employment status and residency, whole single males are not. In addition, Table 10 suggests that the level of charitable giving for single males and single females are different at 10% level of significance.

3.4.1.2) married couples

Married couples mainly can differ on the decision to give and how much to give. From the probit specification in Table 11, results show that when the husband is the sole decision-maker of charitable giving and when the wife is the sole decision-maker, a 1% increase in tax price will cause a 5.4% probability for wife-deciding couples and a 7.3% probability for jointly-deciding couples to donate nothing, respectively. Moreover, the tax price has a statistically negative influence on the wife's decision to give, however, the tax price has a negative but insignificant effect on husband's decision to give. Instead of a unitary family behavior, the result hence suggests a bargaining existence between the husband and the wife. Comparing the giving patterns of husband-deciding couples and wife-deciding couples, Table 12 suggests that the probability of giving is different for husband-deciding couples and jointly-deciding couples at 10% level of significance. However, the probability of giving is not different for husband-deciding couples and wife-deciding couples from zero at conventional significance levels.

Table 11. Probability of Charitable Giving for Married Couples, by Who Decides

	Probability of Giving (Probit)		
	Husband-deciders	Wife-deciders	joint-deciders
Ln (tax price of giving)	-0.0535	-0.0725**	-0.0715*
	(0.042)	(0.034)	(0.040)
Ln (family income)	0.0020	0.0018	0.0023
	(0.003)	(0.002)	(0.003)
AgeH	0.0002	0.0002	0.0001
	(0.000)	(0.000)	(0.000)
AgeW	-0.0002	-0.0002	-0.0001
	(0.000)	(0.000)	(0.000)
High school grad_H	0.0034	0.0052	0.0048
	(0.005)	(0.004)	(0.005)
High school grad_W	-0.0202**	-0.0181***	-0.0150**
	(0.008)	(0.007)	(0.008)
Some college_H	0.0117**	0.0159***	0.0186***
	(0.006)	(0.005)	(0.007)
Some college_W	-0.0228***	-0.0165**	-0.0180**
	(0.009)	(0.007)	(0.008)
College grad_H	0.0149**	0.0141***	0.0136**
	(0.006)	(0.005)	(0.006)
College grad_W	-0.0239***	-0.0247***	-0.0225***
	(0.009)	(0.007)	(0.008)
Hispanic_H	-0.0067	-0.0078	-0.0097
	(0.009)	(0.007)	(0.009)
Hispanic_W	0.0022	-0.0013	0.0015
	(0.010)	(0.008)	(0.010)

Church goer_H	-0.0015	-0.0003	0.0005
	(0.006)	(0.004)	(0.006)
Church goer_W	-0.0001	0.0001	-0.0021
	(0.006)	(0.005)	(0.006)
Health_H	0.0005	0.0011	0.0042
	(0.006)	(0.005)	(0.005)
Health_W	-0.0034	-0.0049	-0.0043
	(0.006)	(0.005)	(0.006)
Working_H	0.0075	-0.0006	0.0009
	(0.005)	(0.004)	(0.005)
Working_W	-0.0003	-0.0007	-0.0001
	(0.004)	(0.003)	(0.004)
Protestant_H	0.0035	0.0015	0.0019
	(0.005)	(0.004)	(0.004)
Protestant_W	-0.0019	-0.0058	-0.0042
	(0.005)	(0.004)	(0.005)
Urban	-0.0076*	-0.0042	-0.0043
	(0.004)	(0.004)	(0.004)
Observations	1168	1793	2833

Notes: [1.] Standard errors are shown in parentheses.
[2.] *** indicates significance at 1% level, ** at 5% level, and * at 10% level.

Table 12. Test of Structural Stability: the Probability of Charitable Giving, by Who Decides

	husband-deciders	wife-deciders	husband-deciders and wife-deciders
log-likelihood	-71.23	-65.58	-136.99
unrestricted	-136.81		
restricted	-136.99		
chi-squres	2*[-136.81-(-108.65)]=0.36		

	husband-deciders	joint-deciders	husband-deciders and joint-deciders
log-likelihood	-71.23	-108.65	-195.35
unrestricted	-179.88		
restricted	-195.35		
chi-squres	2*[-179.88-(-195.35)]=30.94		

	wife-deciders	joint-deciders	wife-deciders and joint-deciders
log-likelihood	-65.58	-108.65	-183.14
unrestricted	-174.23		
restricted	-183.14		
chi-squres	2*[-174.23-(-183.14)]=17.82		

Summarized Results of Coefficient Comparisons

	probability of charitable giving		
	couples (d.f.=22)	couples (d.f.=22)	couples (d.f.=22)
	husband-deciders and wife-deciders	husband-deciders and joint-deciders	wife-deciders and joint-deciders
chi-squares	0.36	30.94*	17.82
p-values	1	0.097	0.72

Notes: [1.] Steps of calculating chi-squares to test the structure stability with hypothesis that charitable giving equations of the parewise goups are the same:

[1).] Fit the same model in each subsample

[2).] Calculated the unrestricted log likelihood is the sum of the subsample log likelihoods: $LogL_{ur}$

[3).] Pool the subsamples, and fit the model to the pooled sample

[4).] Restricted log likelihood is that from the pooled sample: $LogL_r$

[5).] $\chi^2 = 2 * (LogL_{ur} - LogL_r)$

degrees of freedom = (K-1)*model size.

[2.] *** indicates significance at 1% level, ** at 5% level, and * at 10% level.

Table 13. Amount of Charitable Giving for Married Couples, by Who Decides

	Total Contributions (Tobit)		
	Husband-deciders	Wife-deciders	joint-deciders
Ln (tax price of giving)	-0.3137	-1.3281**	-0.9396
	(0.646)	(0.590)	(0.698)
Ln (family income)	0.5449***	0.5027***	0.5210***
	(0.049)	(0.043)	(0.051)
AgeH	0.0182***	0.0112**	0.0184***
	(0.005)	(0.004)	(0.005)
AgeW	0.007	0.0140***	0.0067
	(0.005)	(0.005)	(0.005)
High school grad_H	-0.0942	-0.0021	-0.0897
	(0.077)	(0.066)	(0.081)
High school grad_W	-0.0271	-0.0206	-0.0182
	(0.075)	(0.069)	(0.080)
Some college_H	0.1939**	0.2785***	0.2468***
	(0.080)	(0.070)	(0.085)
Some college_W	0.1500*	0.1645**	0.1551*
	(0.078)	(0.071)	(0.083)
College grad_H	0.2763***	0.3967***	0.2646***
	(0.080)	(0.070)	(0.083)
College grad_W	0.3733***	0.2747***	0.3348***
	(0.080)	(0.074)	(0.085)
Hispanic_H	-0.3398**	-0.3269***	-0.3337**
	(0.135)	(0.117)	(0.143)

Hispanic_W	-0.1914	-0.1638	-0.194
	(0.135)	(0.119)	(0.144)
Church goer_H	0.6983***	0.6603***	0.7258***
	(0.072)	(0.058)	(0.077)
Church goer_W	0.3739***	0.4401***	0.3656***
	(0.076)	(0.062)	(0.081)
Health_H	0.0581	0.0314	0.0724
	(0.081)	(0.070)	(0.085)
Health_W	0.1139	0.0483	0.0788
	(0.075)	(0.068)	(0.080)
Working_H	0.1806**	0.0957	0.1252*
	(0.071)	(0.063)	(0.074)
Working_W	-0.0278	-0.0112	-0.0209
	(0.051)	(0.047)	(0.054)
Protestant_H	0.3500***	0.2687***	0.3665***
	(0.057)	(0.050)	(0.059)
Protestant_W	0.2007***	0.1524***	0.1596***
	(0.057)	(0.051)	(0.060)
Urban	0.1572***	0.1481***	0.1893***
	(0.052)	(0.047)	(0.054)
Observations	1,168	1,793	2,833

Notes: [1.] Standard errors are shown in parentheses.
[2.] *** indicates significance at 1% level, ** at 5% level, and * at 10% level.

Table 14. Test of Structural Stability: the Amount of Charitable Giving, by Who Decides

	husband-deciders	wife-deciders	husband-deciders and wife-deciders
log-likelihood	-1708.66	-2721.27	-4476.17
unrestricted	-4429.93		
restricted	-4476.17		
chi-squres	2*[-4429.93-(-4476.17)]=92.48		

	husband-deciders	joint-deciders	husband-deciders and joint-deciders
log-likelihood	-1708.66	-4307.7	-6052
unrestricted	-6016.36		
restricted	-6052		
chi-squres	2*[-1708.66-(-6052)]=71.28		

	wife-deciders	joint-deciders	wife-deciders and joint-deciders
log-likelihood	-2721.27	-4307.7	-7064.74
unrestricted	-7028.97		
restricted	-7064.74		
chi-squres	2*[-7028.97-(-7064.74)]=71.54		

Summarized Results of Coefficient Comparisons

	Amount of charitable giving		
	couples (d.f.=22)	couples (d.f.=22)	couples (d.f.=22)
	husband-deciders and wife-deciders	husband-deciders and joint-deciders	wife-deciders and joint-deciders
chi-squares	92.48***	71.28***	71.54***
p-values	0	0	0

Notes: [1.] Steps of calculating chi-squares to test the structure stability, with hypothesis that charitable giving equations of the parewise goups are the same:

[1).] Fit the same model in each subsample

[2).] Calculated the unrestricted log likelihood is the sum of the subsample log likelihoods: $LogL_{ur}$

[3).] Pool the subsamples, and fit the model to the pooled sample

[4).] Restricted log likelihood is that from the pooled sample: $LogL_r$

[5).] $\chi^2 = 2 * (LogL_{ur} - LogL_r)$

degrees of freedom = (K-1)*model size.

[2.] *** indicates significance at 1% level, ** at 5% level, and * at 10% level.

From the tobit model results, Table 13 shows that household income, age, education, race, religious preference, residency, and attending church services positively and significantly affect the dollar amount of giving for all groups. However, only households with wives as sole decision-makers are significantly sensitive to the tax price of giving. For example, if the tax price increases 1%, wife-deciding couples will reduce their donation by 1.3%. Moreover, age of wife is positive and significant for the wife-deciding couples; employment status of husband is significant for husband-deciding and jointly-deciding groups. In addition, Table 14 suggests that the level of charitable giving for all possible pairs of groups is different from zero at 1% level of significance. All results strongly imply the existence of bargaining over charitable giving within households, and thus this study investigates the how bargaining influences the household charitable giving next.

3.4.2 Joint Decision-making: Influence of bargaining on charitable giving

When couples make charitable giving decisions jointly, their giving preferences is crucial in determining whether the bargaining increases or reduces charitable giving. When couples have the same giving preference, the amount of time and effort to reach giving decisions to charities will be little. In this case, the charitable giving of one partner can create the "positive externalities" experienced by the other partner, and which is likely to increase the amount of giving by the joint-deciding household. However, when couples have the opposing preferences on charitable giving, more time and effort will be required to reach charitable giving decisions. The opposing tastes in giving thus create "negative externalities" which is likely to reduce the amounts of charitable giving by the household (Andreoni et al. 2003, Wiepking and Bekkers, 2010).

Following Andreoni et al. (2003), this study estimates giving choices by jointly-deciding couples as a linear combination of the amount the husband would choose if he were sole decision-maker, and the amount the wife would choose, were she in charge.[47] Results from Table 15 show estimate for θ_h is 0.561, and for θ_w is 0.359, both with standard error 0.004. In this case, $\theta_h + \theta_w = 0.92 < 1$, which implies that bargaining within marriage reduces charitable giving by 8 percent.[48] It suggests that household bargaining creates costly decision-making, and has decreasing returns to the charitable giving amount by the couples.

The result that bargaining reduces giving is consistent with findings by Andreoni et al. (2003) but not with findings by Yoruk (2009). Sizes of θ_h and θ_w show that $\theta_h > \theta_w$, indicating the husband has significantly greater bargaining power than the wife when they jointly make decisions to give to charities.[49]

This finding suggests the fundraisers to strive to understand the dynamics of the household. While engaging one partner, fundraisers are encouraged to consider both the spouses and learn the preferences of the couple. When meeting with donors, fundraisers and charitable organizations should strive to listen and learn the information of the decision-making authority in charitable giving. Meanwhile, charitable organizations should internally track who signs the contribution checks and keep records of interactions with both the husband and the wife if applicable.

[47] The explanatory variables in the models are price of giving, family income, religiosity, employment status, gender, age, race, residency, education, marital status, and health status.

[48] Although the LHS of equation (5) is censored, I follow other studies and estimate equation (5) via OLS. Tobit estimates of equation (5), which are available upon request, are almost identical to the OLS results.

[49] In Andreoni's study, the weight of the husband's giving preference is 0.677 and the wife's giving preference is 0.260. In Yoruk's study, the weight of the husband's giving preference is 0.499 and the wife's giving preference is 0.567.The finding in this study is in line with Andreoni's that the husband dominates the marital bargain over charitable giving.

Table 15. Estimates of Parameters θ_h and θ_w for All Respondents

All-respondents sample

	Estimated prediction of joint-deciding donations ($\widehat{G_{Jointly}}$)
Estimated prediction of husband-deciding donations ($\widehat{G_{husband}}$)	0.561*** (0.00395)
Estimated prediction of wife-deciding donations ($\widehat{G_{wife}}$)	0.359*** (0.00382)
Constant	-0.0459*** (0.00167)
Observations	16,030
R-squared	0.836

Notes: [1.] Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

[2.] $\widehat{G_{husband}}$ and $\widehat{G_{wife}}$ are the amount of predicted giving that would have been donated by the husband if he had sole control over giving, respectively. $\widehat{G_{jointly}}$ denotes the predicted amount of giving by the joint-deciders.

[3.] Parameters θ_h and θ_w are estimated from:

$$\widehat{G_{jointly}} = \theta_h \widehat{G_{husband}} + \theta_w \widehat{G_{wife}} + \varepsilon_j$$
$$= 0.561 * \widehat{G_{husband}} + 0.359 * \widehat{G_{wife}}$$

[4.] For the Tobit model of each regression, the dependent variable is measured in the natural log form of dollars. The explanatory variables are price of giving, age, Hispanic, residency, health status, education, employment status, church goers, and family income. The full results for all models are presented in TableA10 in the Appendix.

3.4.3 Traditional Gender Roles

Traditional views on gender roles can present impacts on households' financial management. For households with heavier traditional views on gender roles, husbands normally have greater bargaining power over most decisions (Kenney 2006, Wiepking and Bekkers, 2010). According to the literature, religious affiliation is frequently used as a strong determinant of traditional values on gender roles. Especially, households with strict Protestant denominations are found to be relatively more likely to have traditional views of gender roles (Wiepking and Bekkers 2010). The couples with more traditional views on gender roles are expect to have less bargaining and the household charitable giving decision-making is largely in favor of the husbands' giving preference. The couples with less or non-traditional views on gender roles are likely to create relatively more weight of the wives' preference when the couples make decisions jointly.

Based on the information of husbands and wives' religious denominations, the all-respondents sample is parsed into Protestant group and non-protestant group. Giving choices by jointly-deciding Protestant couples are estimated as a linear combination of the amount the husband would choose, were he in charge, and the amount the wife would choose, were she in charge. Results from Table 16 show that θ_h =0.591 (0.0039), and θ_w =0.318 (0.0037). For Protestant households, the result ($\theta_h > \theta_w$) indicates wives have significantly lower bargaining power than the husband when they make charitable decisions together. Since $\theta_h + \theta_w = 0.909 < 1$, it then implies that bargaining among Protestant jointly-deciding couples reduces charitable giving by 9.1 percent on average, and this result is in line with findings of the all-respondents sample.

Table 16. Estimates of Parameters θ_h and θ_w for Protestants

Protestants households

	Estimated prediction of joint-deciding donations ($\widehat{G_{Jointly}}$)
Estimated prediction of husband-deciding donations ($\widehat{G_{husband}}$)	0.591*** (0.00392)
Estimated prediction of wife-deciding donations ($\widehat{G_{wife}}$)	0.318*** (0.00372)
Constant	-0.0163*** (0.00101)
Observations	16,030
R-squared	0.877

Notes: [1.] Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

[2.] $\widehat{G_{husband}}$ and $\widehat{G_{wife}}$ are the amount of predicted giving that would have been donated by the husband if he had sole control over giving, respectively. $\widehat{G_{Jointly}}$ denotes the predicted amount of giving by the joint-deciders.

[3.] Parameters θ_h and θ_w are estimated from:
$\widehat{G_{Jointly}} = \theta_h \widehat{G_{husband}} + \theta_w \widehat{G_{wife}} + \varepsilon_j$
$= 0.591 * \widehat{G_{husband}} + 0.318 * \widehat{G_{wife}}$

[4.] For the Tobit model of each regression, the dependent variable is measured in the natural log form of dollars. The explanatory variables are price of giving, age, Hispanic, residency, health status, education, employment status, church goers, and family income. The full results for all models are presented in TableA11 in the Appendix.

Table 17. Estimates of Parameters θ_h and θ_w for Non-protestants

Non-protestants households

	Estimated prediction of joint-deciding donations ($\widehat{G_{Jointly}}$)
Estimated prediction of husband-deciding donations ($\widehat{G_{husband}}$)	0.511*** (0.00397)
Estimated prediction of wife-deciding donations ($\widehat{G_{wife}}$)	0.355*** (0.00380)
Constant	-0.0196*** (0.00110)
Observations	16,030
R-squared	0.828

1. Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

2. $\widehat{G_{husband}}$ and $\widehat{G_{wife}}$ are the amount of predicted giving that would have been donated by the husband if he had sole control over giving, respectively. $\widehat{G_{Jointly}}$ denotes the predicted amount of giving by the joint-deciders.

3. Parameters θ_h and θ_w are estimated from:
$\widehat{G_{Jointly}} = \theta_h \widehat{G_{husband}} + \theta_w \widehat{G_{wife}} + \varepsilon_j$
$= 0.511 * \widehat{G_{husband}} + 0.355 * \widehat{G_{wife}}$

4. For the Tobit model of each regression, the dependent variable is measured in the natural log form of dollars. The explanatory variables are price of giving, age, Hispanic, residency, health status, education, employment status, church goers, and family income. The full results for all models are presented in TableA12 in the Appendix.

Non-protestant households, in contrast, showing values of θ_h and θ_w have similar patterns ($\theta_h > \theta_w$). Table 17 presents that θ_h=0.511 (0.004), and θ_w=0.355 (0.0038), which suggests that for non-protestant households, wives have much greater bargaining power over charitable giving than husbands. $\theta_h + \theta_w = 0.866 < 1$ suggests a 13.4 percent decrease in charitable giving with the occurrence of bargaining within households. Thus, for couples who are categorized to Protestant denominations, the wives indeed have a much lower authority to decide on the household's charitable giving; and for couples who belong to less or non-protestant denominations, the husbands have 8 percentage points decline in their decision-making authority over charitable giving. The results here revealed that traditional gender roles influence household bargaining over charitable contribution.

3.5 Discussion and Policy Implications

This study investigates who has relatively more bargaining power when the husband and the wife make joint decisions on donations, whether the intra-household bargaining over charitable giving essentially increase or reduce the amount of charitable contributions, and whether traditional views on gender roles matter. These questions are far from clear based on existing studies.

Using a longitudinal dataset, this study finds that the husband has significantly greater bargaining power than the wife when they jointly make decisions to give to charities, and the joint-decisions on charitable giving include 56% of the husband's preference and 36% of the wife's preference. Instead of being beneficial to the amount of household giving to charities, the household bargaining is costly. The costly household bargaining generally reduces the household donation by 8%. These finding are in line with the results of Andreoni et al. (2003) who use the

pooled cross-sectional data, but contrast with the findings of Yoruk (2009) who uses a cross-sectional data. The panel data used in this study possess major advantages over conventional cross-sectional data set, and additionally the COPPS panel data not only has a larger sample size but has no problem of missing data.

This study also supports the theory of traditional views on gender roles. For strict Protestant couples, the wives indeed have a much lower authority to decide on the household's charitable giving. However for couples who have less or non-protestant denominations, the husbands present a much lower authority but still dominate the decision-making on charitable giving. The bargaining in households with less traditional views on gender roles creates more "negative externalities" which yields a 13% decrease in the amounts donated.

This finding thus suggests the fundraisers to strive to understand the dynamics of the household. While engaging one partner, fundraisers are encouraged to consider and learn the preferences of the couple. In addition, this finding suggests the policy makers to avoid using generalizations when they consider their donors. Fundraising plan with the charitable organization is not a one-size-fits-all strategy, and efficient fundraising plans require more varieties and flexibilities.

CHAPTER 4

CONCLUSIONS

Why people give their hard-earned money away has been attracting considerable attention of researchers. American donors were more generous than ever in 2014, giving an estimated $358.4 billion to charity. People's altruistic behaviors can be influenced by many factors. Income, education, and employment status are positively associated with individuals' charitable giving decisions. However, evidence in the literature on the causal relationship between the degree of religiosity and charitable giving is still mixed. Additionally, little is known about the interaction effects between religiosity and gender on charitable giving.

The first essay is interested in two questions. In particular, whether people who engage in religious activities are more generous in terms of both religious and secular giving, and whether gender differences exist in charitable giving within different levels of religiosity.

The first essay has two main results. First, people who have higher religiosity have a greater propensity to give as well as higher levels of charitable giving to not only religious organizations, but also secular organizations. However, the propensity and amount of giving in that group are much lower for secular giving. These findings are consistent with many previous studies; however, the bivariate probit and bivariate tobit estimations provide unbiased and efficient estimates. The bivariate systems permit a test of correlation across the decisions of different giving, and this study finds that the correlation between religious giving and secular

giving is strongly significant. By controlling such a correlation, the impacts of religiosity on religious and secular giving are not as significant as we would have thought, taking into account the correlations between different types of giving.

Second, although giving differences between men and women are not immediately evident, taking religiosity into account, differences in men's and women's propensities to give to philanthropy are found. Based on the finding that highly religious men and women are generous donors, results show that gender difference only exists between highly religious men and women for small donations. Highly religious men are 1.8 percent more likely to make small donations than highly religious women. Nonetheless, highly religious men and women do not have any difference in giving among medium and large donation amounts. In contrast, gender differences exist between men and women with low religiosity for all levels of giving. Women with low religiosity show greater propensity (6 percent) to make small donations than their counterparts; however, men with low religiosity are more likely to make medium and large donations than women with low religiosity.

Since there are opposite gender-based differences for religious and less-religious individuals, charitable organizations can consider tailoring different fundraising plans. For instance, charitable organizations could specifically solicit donations from highly religious men and less-religious women in order to turn these non-donors into donors. Hence, charitable organizations should make different soliciting plans.

Husband and wife make decisions through bargaining and negotiation. However, major literature has treated the charitable decisions from husband and wife indifferently. Little is known about spousal bargaining over decisions to give to charities within families. Most research on charitable giving assumes that decisions on charitable giving are a household's

decision rather than an individual's decision. Rare studies exist on the intra-household bargaining over giving to charities, and the results of existing studies are mixed.

The second essay offers new evidence of spousal bargaining over charitable donations within a household, using a longitudinal dataset. Previous studies use either pooled cross-sectional or cross-sectional data, under the very restrictive assumption that there are no unobserved individual effects. However, failure to adequately control for certain unobserved characteristics may cause unreliable estimators. This study therefore reduces such bias and inconsistency by estimating panel models. Additionally, the quality of the survey data used in this study is superior to other frequently-used household surveys of giving (Wilhelm, 2006).

Second, the second essay provides new insights into the question of "who is prevailing in the intra-household bargaining over charitable giving" by investigating traditional views on gender roles. Empirical results of the second essay support the theory of traditional views on gender roles. Results show that for strict Protestant couples, the wives indeed have a much lower authority to decide on the household's charitable giving. However for couples who have less or non-protestant denominations, the husbands present a much lower authority but still dominate the decision-making on charitable giving. The bargaining in households with less traditional views on gender roles creates more "negative externalities" which yields a decrease in the amounts donated.

This finding thus suggests the fundraisers to strive to understand the dynamics of the household. While engaging one partner, fundraisers are encouraged to consider and learn the preferences of the couple. In addition, this finding suggests the policy makers to avoid using generalizations when they consider their donors. Fundraising plan with the charitable

organization is not a one-size-fits-all strategy, and efficient fundraising plans require more varieties and flexibilities.

LIST OF REFERENCES

Addoum, Jawad M., and Howard Kung. *Household bargaining and asset allocation*. Duke University working paper, 2011.

Andreoni, James, and Lise Vesterlund. "Which is the fair sex? Gender differences in altruism." *Quarterly Journal of Economics* (2001): 293-312.

Andreoni, James, Eleanor Brown, and Isaac Rischall. "Charitable Giving by Married Couples Who Decides and Why Does it Matter?." *Journal of Human Resources* 38.1 (2003): 111-133.

Andreoni, James. "Impure Altruism and Donations to Public Goods: A Theory of Warm-Glow Giving." *The Economic Journal* 100 No.401 (Jun. 1990): 464-477.

Andreoni, James. "Philanthropy." *Handbook of the Economics of Giving, Altruism and Reciprocity* 2 (2006): 1201-1269.

Azzi, Corry, and Ronald Ehrenberg. "Household allocation of time and church attendance." *The Journal of Political Economy* (1975): 27-56.

Bekkers, Rene and Pamala Wiepking. "A Literature Review of Empirical Studies of Philanthropy: Eight Mechanisms That Drive Charitable Giving." *Nonprofit and Voluntary Sector Quarterly* 40 No.5 (Apr. 2011): 924-973.

Bekkers, Rene and Pamala Wiepking. "Generosity and Philanthropy: A literature Review." Working paper, (Oct. 2007).

Bekkers, Rene and Pamala Wiepking. "To Give or Not to Give, That is the Question: How Methodology is Destiny in Dutch Giving Data." *Nonprofit and Voluntary Sector Quarterly* 35 (2006): 533-540.

Bekkers, René, and Theo Schuyt. "And Who is Your Neighbor? Explaining Denominational Differences in Charitable Giving and Volunteering in the Netherlands." *Review of Religious Research* (2008): 74-96.

Blundell, Richard, and Costas Meghir. "Bivariate Alternatives to the Tobit Model." *Journal of Econometrics* 34.1 (1987): 179-200.

Brooks, Arthur C. "Does Social Capital Make You Generous?*." *Social Science Quarterly* 86, no. 1 (2005): 1-15.

Brooks, Arthur C. "Faith, Secularism, and Charity." *Faith & Economics*, No.43 (Spring 2004): 1-8.

Brown, Eleanor, and James M. Ferris. "Social capital and philanthropy: An analysis of the impact of social capital on individual giving and volunteering." *Nonprofit and Voluntary Sector Quarterly* 36.1 (2007): 85-99.

Brown, Eleanor, Christopher J. Einolf, and Mark O. Wilhelm. *Giving in the United States: Generous Philanthropy in a Classic Liberal Regime.*

Brown, Eleanor. "Household decisions regarding charitable gifts." PhD diss., Scripps College, 2000.

Browning, Martin, and Pierre-Andre Chiappori. "Efficient intra-household allocations: A general characterization and empirical tests." *Econometrica*(1998): 1241-1278.

Cappellari, Lorenzo, and Stephen P. Jenkins. "Multivariate probit regression using simulated maximum likelihood." *The Stata Journal* 3.3 (2003): 278-294.

Castle, Martha Taylor, and Sondra Shaw-Hardy. "Women as Philanthropists."

Chiappori, Pierre-Andre. "Collective labor supply and welfare." *Journal of political Economy* (1992): 437-467.

Chiappori, Pierre-Andr é "Rational household labor supply." *Econometrica: Journal of the Econometric Society* (1988): 63-90.

Cox, James C., and Cary A. Deck. "When are women more generous than men?." *Economic Inquiry* 44, no. 4 (2006): 587-598.

De Oliveira, Angela, Rachel TA Croson, and Catherine Eckel. "The Giving Type: Identifying Donors." *Journal of Public Economics* 95, no. 5 (2011): 428-435.

Deaton, Angus, and John Muellbauer. "An Almost Ideal Demand System." *The American economic review* (1980): 312-326.

DellaVigna, Stefano, et al. *The importance of being marginal: Gender differences in generosity*. No. w18748. National Bureau of Economic Research, 2013.

Dellavigna, Stefano; John List and Ulrike Malmendier. "Testing for Altruism and Social Pressure in Charitable Giving." *The Quarterly Journal of Economics* 127 No.1, (Feb. 2012):1-56.

Diamond, William and Stephanie Noble. "Defensive Responses to Charitable Direct Mail Solicitations." *Journal of Interactive Marketing* 15 No.3 (Summer 2001): 2-12.

Diepen, Merel; Bas Donkers and Philip Franses. "Does Irritation Induced by Charitable Direct Mailings Reduce Donations?" *International Journal of Research in Marketing,* (Mar.2009).

Eckel, Catherine C and Philip J. Grossman. "Giving to Secular Causes by the Religious and Nonreligious: An Experimental Test of the Responsiveness of Giving to Subsidies." *Nonprofit and Voluntary Sector Quarterly*, (2004) 33: 271.

Eckel, Catherine C and Philip J. Grossman. “Rebate versus Matching: Does How We Subsidize Charitable Contributions Matter?” *Journal of Public Economics* 87 (2003) 681-701.

Einolf, Christopher J. "Gender differences in the correlates of volunteering and charitable giving." *Nonprofit and Voluntary Sector Quarterly* 40, no. 6 (2011): 1092-1112.

Forbes, Kevin F. and Ernest M. Zampelli. “The Impacts of Religion, Political Ideology, and Social Capital on Religious and Secular Giving: Evidence from the 2006 Social Capital Community Survey.” *Applied Economics,* (2013), 45, 2481-2490.

Giving USA. “Giving USA 2013 Report Highlights.” Retrieved Feb. 2014 from Giving USA website: http://store.givingusareports.org/Giving-USA-2013-Report-Highlights-P98.aspx.

Gruber, Jonathan. "Pay or pray? The impact of charitable subsidies on religious attendance." *Journal of Public Economics* 88, no. 12 (2004): 2635-2655.

Harbaugh, William T. “The prestige motive for making charitable transfers.” *American Economic Review* (1998): 277-282.

Harris, Mark and Xueyan Zhao. “A Zero-inflated Ordered Probit Model, with an Application to Modeling Tobacco Consumption.” *Journal of Econometrics* 141 (Mar. 2007): 1073-1099.

Helmreich, R. L., Spence, J. T., & Gibson, R. H. (1982). Sex-role attitudes: 1972–1980. Personality and Social Psychology Bulletin, 8, 656–663.

Helms, Sara and Jeremy Thornton. ”The Influence of Religiosity on Charitable Behavior: A COPPS Investigation.” *The Journal of Socio-Economics* 41 (2012): 373-383.

Hiller, Dana V., and William W. Philliber. "The division of labor in contemporary marriage: Expectations, perceptions, and performance." *Social Problems* 33, no. 3 (1986): 191-201.

Hrung, Warren B. "After-Life Consumption and Charitable Giving." *American Journal of Economics and Sociology* 63, no. 3 (2004): 731-745.

Jackson, Elton F., Mark D. Bachmeier, James R. Wood, and Elizabeth A. Craft. “Volunteering and charitable giving: Do religious and associational ties promote helping behavior?.” *Nonprofit and Voluntary Sector Quarterly* 24, no. 1 (1995): 59-78.

Jeliazkov, Ivan, and Esther Hee Lee. "MCMC perspectives on simulated likelihood estimation." *Advances in Econometrics* 26 (2010): 3-39.

Kenney, Catherine T. "The Power of the Purse Allocative Systems and Inequality in Couple Households." *Gender & Society* 20.3 (2006): 354-381.

Kolm, Serge-Christophe, and Jean Mercier Ythier, eds. *Handbook of the Economics of Giving, Altruism and Reciprocity: Foundations*. Vol. 1. Elsevier, 2006.

Li, Yan. “Charitable Giving by Married Couples: Who is Prevailing in the Bargaining?” *Working Paper*, 2014.

List, John A. "The market for charitable giving." *The Journal of Economic Perspectives* (2011): 157-180.

Lo, Chu-Ping, and Sanae Tashiro. "Are women more generous than men? Evidence from the US Consumer Expenditure Survey." *Journal of Gender Studies* 22, no. 3 (2013): 282-296.

Lührmann, Melanie, and Jürgen Maurer. *Who wears the trousers? A semiparametric analysis of decision power in couples*. No. CWP25/07. cemmap working paper, Centre for Microdata Methods and Practice, 2007.

Lundberg, Shelly, and Robert A. Pollak. "Bargaining and distribution in marriage." *The Journal of Economic Perspectives* (1996): 139-158.

Lundberg, Shelly, and Robert A. Pollak. "Separate spheres bargaining and the marriage market." *Journal of political Economy* (1993): 988-1010.

Lunn, John, Robin Klay, and Andrea Douglass. "Relationships among giving, church attendance, and religious belief: the case of the Presbyterian Church (USA)." *Journal for the Scientific Study of Religion* 40, no. 4 (2001): 765-775.

Maddala, G.S.. “Limited Dependent and Qualitative Variables in Econometrics.” *Cambridge University Press*, Cambridge, UK. (1983).

Manser, Marilyn, and Murray Brown. "Marriage and household decision-making: A bargaining analysis." *International economic review* (1980): 31-44.

McElroy, Marjorie B., and Mary Jean Horney. "Nash-bargained household decisions: Toward a generalization of the theory of demand." *International Economic Review* (1981): 333-349.

Mesch, Debra J., Melissa S. Brown, Zachary I. Moore, and Amir Daniel Hayat. "Gender differences in charitable giving." *International Journal of Nonprofit and Voluntary Sector Marketing* 16, no. 4 (2011): 342-355.

Mesch, Debra; Patrick Rooney; Kathryn Steinberg and Brian Denton. “The Effects of Race, Gender, and Marital Status on Giving and Volunteering in Indiana.” *Nonprofit and Voluntary Sector Quarterly* 35 No.4 (Dec.2006): 565-587.

O’Herlihy, Mary A., John J. Havens, and Paul G. Schervish. "Charitable giving: How much, by whom, to what, and how." *The non-profit sector: A research handbook* (2002): 542-567.

Pahl, Jan. "His money, her money: Recent research on financial organization in marriage." *Journal of Economic Psychology* 16.3 (1995): 361-376.

Piper, Greg, and Sylke V. Schnepf. "Gender differences in charitable giving in Great Britain." *Voluntas: International Journal of Voluntary and Nonprofit Organizations* 19, no. 2 (2008): 103-124.

Piper, Greg, and Sylke V. Schnepf. "Gender differences in charitable giving in Great Britain." *Voluntas: International Journal of Voluntary and Nonprofit Organizations* 19, no. 2 (2008): 103-124.

Pollak, Robert A. *Bargaining power in marriage: Earnings, wage rates and household production*. No. w11239. National Bureau of Economic Research, 2005.

Ramful, Preety, and Xueyan Zhao. "Participation in Marijuana, Cocaine and Heroin Consumption in Australia: A Multivariate Probit Approach." *Applied Economics* 41.4 (2009): 481-496.

Ribar, David C., and Mark O. Wilhelm. "Altruistic and Joy-of-Giving Motivations in Charitable Behavior." *Journal of Political Economy* 110, no. 2 (2002): 425-457.

Rooney, Patrick M., Debra J. Mesch, William Chin, and Kathryn S. Steinberg. "The effects of race, gender, and survey methodologies on giving in the US."*Economics Letters* 86, no. 2 (2005): 173-180.

Rooney, Patrick, Eleanor Brown, and Debra Mesch. "Who decides in giving to education? A study of charitable giving by married couples." *International Journal of Educational Advancement* 7.3 (2007): 229-242.

Samuelson, Paul A. "Social indifference curves." *The Quarterly Journal of Economics* (1956): 1-22.

Showers, Vince E., Linda S. Showers, Jeri M. Beggs, and James E. Cox Jr. "Charitable giving expenditures and the faith factor." *American journal of economics and sociology* 70, no. 1 (2011): 152-186.

Thomas, Duncan. "Intra-household resource allocation: An inferential approach."*Journal of human resources* (1990): 635-664.

Vesterlund, Lise. "Why Do People Give." *The nonprofit sector: A research handbook* 2 (2006): 168-190.

Wang, Lili, and Elizabeth Graddy. "Social capital, volunteering, and charitable giving." *Voluntas: International Journal of Voluntary and Nonprofit Organizations*19, no. 1 (2008): 23-42.

Wiepking, Pamala, and Beth Breeze. "Feeling Poor, Acting Stingy: the Effect of Money Perceptions on Charitable Giving." *International Journal of Nonprofit and Voluntary Sector Marketing* 17.1 (2012): 13-24.

Wiepking, Pamala, and René Bekkers. "Does who decides really matter? Causes and consequences of personal financial management in the case of larger and structural charitable donations." *Voluntas: International Journal of Voluntary and Nonprofit Organizations* 21.2 (2010): 240-263.

Wilhelm, Mark O. "New data on charitable giving in the PSID." *Economics Letters* 92, no. 1 (2006): 26-31.

Wilhelm, Mark O. "The quality and comparability of survey data on charitable giving." *Nonprofit and Voluntary Sector Quarterly* 36.1 (2007): 65-84.

Wuthnow, Robert. "Acts of Compassion: Caring for Others and Helping Ourselves." Princeton, New Jersey: Princeton University Press. (1991).

Yörük, Bariş K. "Charitable giving by married couples revisited." *Journal of Human Resources* 45, no. 2 (2010): 497-516.

Yörük, Barış K. "The impact of charitable subsidies on religious giving and attendance: Evidence from panel data." *Review of Economics and Statistics* 95, no. 5 (2013): 1708-1721.

LIST OF APPENDICES

APPENDIX A: STATISTICS DESCRIPTION OF CHAPTER 2

Table A1
Statistics Description, Religiosity and Gender Difference

Name	Description	Mean	Std. Dev.
Give	Whether choose to give	0.8544	0.3528
Totgive	Total household giving	2642.59	8207.84
Gender	Male=1	0.4300	0.4951
Born usa	Born in the USA=1	0.9236	0.2656
Race	black=1	0.0960	0.2946
Ownrent	Own or rent primary residence (own=1)	0.7016	0.4576
Religiosity	Active in a religious involvements (attending religious services every week or nearly every week=1)	0.4262	0.4985
Income	Total annual income	56223.30	46694.15
Confidence char	High or some confidence in charitable organizations=1	0.9027	0.2963
Have more give more	Have more, give more	0.7256	0.4463
Edu colgrd	College grad=1	0.3205	0.4667
Age10	Continuous value for age, divided by 10	48.3149	16.2806
Childyes	Have children under 18 in household=1	0.3676	0.4822
Size	Total number of people in the household	1.7920	0.6851
Marital status	Married or living with significant others=1; while singles, widowed, divorced, and separated=0	0.5443	0.4981
Inadequacy	Worry about not having enough $=1	0.5789	0.4938
Trust	1 if most people can be trusted	0.3590	0.4798

[1.] Individuals characteristics, such as gender, race, and age, are the characteristics of survey respondents.

APPENDIX B: BVP AND BVT SPECIFICATIONS, BY TYPES OF GIVING

Table A2
Probit Specification, Religious Giving

Dependent Variable of BVP Model: Propensity of Giving

	Religious Giving					
	Single Probit		Bivariate Probit			
				Marginal Effect		
	Coefficient	Marginal Effect	Coefficient	Direct Effect	Indirect Effect	Total Effect
Religiosity (1 if high)	0.7180***	0.2658***	0.7182***	0.2651***	-0.0120***	0.2531***
	(0.0434)	(0.0156)	(0.0435)	(0.0160)	(0.0023)	(0.0159)
Gender (1 if male)	-0.0058	-0.0022	-0.0057	-0.0021	0.0058***	0.0036
	(0.0442)	(0.0165)	(0.0440)	(0.0163)	(0.0020)	(0.0161)
Age	0.0174***	0.0065***	0.0173***	0.0064***	-0.0003***	0.0062***
	(0.0017)	(0.0006)	(0.0017)	(0.0006)	(0.0001)	(0.0006)
Born in the USA	0.1817**	0.0695**	0.1834**	0.0677**	-0.0028	0.0649**
	(0.0794)	(0.0309)	(0.0793)	(0.0293)	(0.0033)	(0.0294)
Race (1 if Black)	-0.0360	-0.0135	-0.0342	-0.0126	0.0041	-0.0086
	(0.0726)	(0.0274)	(0.0706)	(0.0261)	(0.0029)	(0.0260)
Employed	0.1107**	0.0415**	0.1080**	0.0399 **	-0.0097***	0.0301
	(0.0526)	(0.0199)	(0.0529)	(0.0195)	(0.0025)	(0.0194)
Married	0.2105***	0.0790***	0.2091***	0.0772***	-0.0055**	0.0717***
	(0.0531)	(0.0200)	(0.0528)	(0.0195)	(0.0023)	(0.0194)
Children under 18 in HH	0.1893***	0.0699***	0.1877***	0.0693***	-0.0003	0.0690***
	(0.0511)	(0.0186)	(0.0510)	(0.0188)	(0.0022)	(0.0185)
College_ grad	0.1724***	0.0635***	0.1743***	0.0644***	-0.0073***	0.0570***
	(0.0504)	(0.0183)	(0.0512)	(0.0189)	(0.0026)	(0.0187)
Income	0.0134**	0.0050**	0.0131***	0.0048***	-0.0038***	0.0010
	(0.0054)	(0.0020)	(0.0047)	(0.0017)	(0.0005)	(0.0018)
Family size	0.0869**	0.0324**	0.0890**	0.0329**	0.0010	0.0339**
	(0.0367)	(0.0137)	(0.0363)	(0.0134)	(0.0014)	(0.0135)
_cons	-1.5804***	0.0000***	-1.5782***	0.0000***	0.0000***	0.0000***
	(0.1483)	(0.0000)	(0.1471)	(0.0000)	(0.0000)	(0.0000)

[1.] Standard errors are shown in parentheses. ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively.
[2.] The explanatory variables in the BVP models are gender, age, race, residency, marital status, education, and family size.
[3.] Marginal effects from the BVP model, including direct effects and indirect effects are provided by LimDep.
[4.] Direct Effect is the derivatives of $E[y_1|X_1, X_2, y_2 = 1]$ with respect to X_1;
Indirect Effect is the derivatives of $E[y_1|X_1, X_2, y_2 = 1]$ with respect to X_2.

Table A3
Probit Specification, Secular Giving

Dependent Variable of BVP Model: Propensity of Giving

	Secular Giving					
	Single Probit		Bivariate Probit			
	Coefficient	Marginal Effect	Coefficient	Marginal Effect		
				Direct Effect	Indirect Effect	Total Effect
Religiosity (1 if high)	0.3642***	0.0632***	0.3623***	0.0475***	-0.0170***	0.0304***
	(0.0551)	(0.0098)	(0.0556)	(0.0075)	(0.0020)	(0.0077)
Gender (1 if male)	-0.1761***	-0.0303***	-0.1737***	-0.0228***	0.0001	-0.0226***
	(0.0562)	(0.0098)	(0.0573)	(0.0074)	(0.0010)	(0.0073)
Age	0.0072***	0.0012***	0.0076***	0.0010***	-0.0004***	0.0006**
	(0.0020)	(0.0003)	(0.0019)	(0.0003)	(0.0001)	(0.0003)
Born in the USA	0.0865	0.0154	0.0837	0.0110	-0.0044**	0.0066
	(0.0963)	(0.0179)	(0.0992)	(0.0131)	(0.0019)	(0.0132)
Race (1 if Black)	-0.1275	-0.0231	-0.1225	-0.0160	0.0008	-0.0152
	(0.0858)	(0.0166)	(0.0856)	(0.0113)	(0.0017)	(0.0112)
Employed	0.2952***	0.0532***	0.2939***	0.0385***	-0.0026**	0.0359***
	(0.0655)	(0.0126)	(0.0684)	(0.0092)	(0.0013)	(0.0092)
Married	0.1651**	0.0285**	0.1661**	0.0218**	-0.0050***	0.0168*
	(0.0664)	(0.0118)	(0.0662)	(0.0087)	(0.0013)	(0.0087)
Children under 18 in HH	-0.0084	-0.0014	0.0078	0.0010	-0.0045***	-0.0034
	(0.0661)	(0.0112)	(0.0666)	(0.0087)	(0.0013)	(0.0086)
College_ grad	0.2105***	0.0340***	0.2214***	0.0290***	-0.0041***	0.0249***
	(0.0705)	(0.0109)	(0.0725)	(0.0096)	(0.0013)	(0.0095)
Income	0.1224***	0.0207***	0.1149***	0.0150***	-0.0003***	0.0147***
	(0.0119)	(0.0018)	(0.0114)	(0.0015)	(0.0001)	(0.0015)
Family size	-0.0383	-0.0065	-0.0304	-0.0040	-0.0021**	-0.0061
	(0.0441)	(0.0075)	(0.0428)	(0.0056)	(0.0009)	(0.0057)
_cons	-0.2059	0.0000***	-0.2112	0.0000***	0.0000***	0.0000***
	(0.1767)	(0.0000)	(0.1730)	(0.0000)	(0.0000)	(0.0000)

[1.] Standard errors are shown in parentheses. ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively.
[2.] The explanatory variables in the BVP models are gender, age, race, residency, marital status, education, and family size.
[3.] Marginal effects from the BVP model, including direct effects and indirect effects are provided by LimDep.
[4.] Direct Effect is the derivatives of $E[y_1|X_1, X_2, y_2 = 1]$ with respect to X_1;
Indirect Effect is the derivatives of $E[y_1|X_1, X_2, y_2 = 1]$ with respect to X_2.

Table A4
Tobit Specification, Religious Giving

Dependent Variable of BVT Model: Actual Amount of Giving				
Religious Giving				
	Single Tobit		**Bivariate Tobit**	
	Coefficient	**Marginal Effect**	**Coefficient**	**Marginal effect**
Religiosity (1 if high)	1.4791*** (0.0952)	0.7170*** (0.0453)	1.3522*** (0.1032)	1.0288*** (0.0979)
Gender (1 if male)	0.1269 (0.0943)	0.0626 (0.0467)	0.1428 (0.0972)	0.0722 (0.0516)
Age	0.0310*** (0.0036)	0.0152*** (0.0018)	0.0251*** (0.0036)	0.0238*** (0.0050)
Born in the USA	0.4202** (0.1781)	0.1949** (0.0776)	0.3568* (0.2123)	0.2127 (0.1316)
Race (1 if Black)	0.1620 (0.1559)	0.0814 (0.0800)	0.1798 (0.1534)	0.0906 (0.0809)
Employed	0.2146* (0.1127)	0.1044* (0.0542)	0.2333** (0.1136)	0.1268* (0.0689)
Married	0.5442*** (0.1152)	0.2639*** (0.0550)	0.4272*** (0.1252)	0.2526*** (0.0789)
Children under 18 in HH	0.2722** (0.1094)	0.1355** (0.0550)	0.3397*** (0.1139)	0.1856*** (0.0651)
College_grad	0.4430*** (0.1037)	0.2238*** (0.0537)	0.3923*** (0.1045)	0.2117*** (0.0614)
Income	0.1290*** (0.0105)	0.0635*** (0.0052)	0.1265*** (0.0065)	0.0957*** (0.0107)
Family size	0.1290 (0.0805)	0.0635 (0.0396)	0.1141 (0.0890)	0.0631 (0.0518)

[1.] Standard errors are shown in parentheses. ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively.
[2.] For Bivariate Tobit model, the dependent variable is measured in thousands of dollars. The explanatory variables in the BVT models are gender, age, race, residency, marital status, education, and family size.
[3.] Marginal effects from the BVT model are calculated using Delta Method.

Table A5
Tobit Specification, Secular Giving

Dependent Variable of BVT Model: Actual Amount of Giving				
Secular Giving				
	Single Tobit		**Bivariate Tobit**	
	Coefficient	**Marginal Effect**	**Coefficient**	**Marginal effect**
Religiosity (1 if high)	0.9881*** (0.2957)	0.5360*** (0.1599)	0.6969* (0.4050)	0.4458** (0.2247)
Gender (1 if male)	-0.2003 (0.2985)	-0.1088 (0.1620)	-0.0903 (0.3874)	-0.0460 (0.1389)
Age	0.0586*** (0.0113)	0.0319*** (0.0062)	0.0279* (0.0155)	0.0287* (0.0165)
Born in the USA	-0.4700 (0.5495)	-0.2602 (0.3094)	-0.3846 (0.8427)	-0.1479 (0.1315)
Race (1 if Black)	-0.4608 (0.5003)	-0.2466 (0.2633)	-0.4636 (0.9368)	-0.2163 (0.2329)
Employed	0.1352 (0.3557)	0.0734 (0.1927)	0.2150 (0.4511)	0.1123 (0.2088)
Married	0.5423 (0.3633)	0.2939 (0.1960)	0.2899 (0.5630)	0.1652 (0.2232)
Children under 18 in HH	-0.1494 (0.3423)	-0.0812 (0.1856)	0.0200 (0.5662)	0.0106 (0.1717)
College_grad	-0.0236 (0.3307)	-0.0128 (0.1798)	-0.0462 (0.4143)	-0.0205 (0.1598)
Income	0.6712*** (0.0343)	0.3652*** (0.0191)	0.6285*** (0.0164)	1.0903*** (0.1007)
Family size	-0.7767*** (0.2543)	-0.4226*** (0.1384)	-0.7802** (0.3738)	-0.0119 (0.1177)

[1.] Standard errors are shown in parentheses. ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively.
[2.] For Bivariate Tobit model, the dependent variable is measured in thousands of dollars. The explanatory variables in the BVT models are gender, age, race, residency, marital status, education, and family size
[3.] Marginal effects from the BVT model are calculated using Delta Method.

APPENDIX C: ZIOP RESULTS, BY RELIGIOSITY

Table A6
ZIOP Marginal Effects, All Sample

	Prob (g=0)			Prob (g=1)	Prob (g=2)	Prob (g=3)
	Non-participation Pr(τ=0)	Zero contribution Pr(τ=1,$\tilde{g}$=0)	Full Pr(g=0)			
gender	0.0073	0.0009	0.0081 (0.0088)	0.0091 (0.0075)	-0.0045 (0.0116)	-0.0002 (0.0014)
Race	0.0063	-0.0050	0.0013 (0.0105)	-0.0043 (0.0086)	0.0074 (0.0172)	0.0008 (0.0020)
bornusa	-0.0155	0.0173	0.0018 (0.0122)	0.0215** (0.0099)	-0.0281 (0.0209)	-0.0028 (0.0024)
ownrent	-0.0553	-0.0301	-0.0854*** (0.0081)	-0.1199*** (0.0067)	0.0805*** (0.0125)	0.0059*** (0.0015)
employed	-0.0549	-0.0037	-0.0586*** (0.0083)	-0.0628*** (0.0069)	0.0282** (0.0128)	0.0013 (0.0015)
income	-0.0056	-0.0155	-0.0210*** (0.0019)	-0.0388*** (0.0017)	0.0326*** (0.0016)	0.0028*** (0.0002)
childyes	-0.0327	0.0060	-0.0267** (0.0111)	-0.0199** (0.0094)	0.0007 (0.0148)	-0.0006 (0.0018)
educ	-0.0473	-0.0099	-0.0571*** (0.0108)	-0.0684*** (0.0093)	0.0375*** (0.0127)	0.0023 (0.0016)
age10	0.0045	-0.0055	-0.0010 (0.0016)	-0.0073*** (0.0012)	0.0091*** (0.0035)	0.0009** (0.0004)
Family size	0.0023	0.0147	0.0170*** (0.0053)	0.0338*** (0.0045)	-0.0298*** (0.0075)	-0.0026*** (0.0009)
confidence	-0.1451	-0.0364	-0.1815*** (0.0076)	-0.2231*** (0.0056)	0.1269*** (0.0188)	0.0082*** (0.0021)
trust		-0.0209	-0.0209** (0.0096)	-0.0239** (0.0110)	0.0412** (0.0189)	0.0036** (0.0017)
Have more give more		-0.1446	-0.1446*** (0.0100)	-0.1655*** (0.0114)	0.2851*** (0.0197)	0.0251*** (0.0017)
inadequacy		0.0339	0.0339*** (0.0088)	0.0388*** (0.0101)	-0.0668*** (0.0174)	-0.0059*** (0.0015)

[1.] Standard errors are shown in parentheses. ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

Table A7
ZIOP Marginal Effects, Religious Group

	Prob (g=0)			Prob (g=1)	Prob (g=2)	Prob (g=3)
	Non-participation Pr(τ=0)	Zero contribution Pr(τ=1,$\tilde{g}$=0)	Full Pr(g=0)			
gender	0.0236	-0.0017	0.0219*	0.0178***	-0.0058	0.0002
			(0.0125)	(0.0007)	(0.0195)	(0.0027)
Race	0.0290	0.0070	0.0360***	0.0523***	-0.0347	-0.0026
			(0.0137)	(0.0032)	(0.0259)	(0.0035)
bornusa	0.0053	0.0054	0.0107	0.0232***	-0.0187	-0.0018
			(0.0202)	(0.0058)	(0.0402)	(0.0054)
ownrent	-0.0502	-0.0194	-0.0696***	-0.1150***	0.0821***	0.0068**
			(0.0121)	(0.0014)	(0.0201)	(0.0028)
employed	-0.0854	-0.0028	-0.0882***	-0.0947***	0.0482**	0.0022
			(0.0119)	(0.0026)	(0.0221)	(0.0030)
income	-0.0024	-0.0103	-0.0126***	-0.0367***	0.0322***	0.0032***
			(0.0024)	(0.0003)	(0.0028)	(0.0004)
childyes	-0.0663	-0.0079	-0.0742***	-0.0928***	0.0549**	0.0035
			(0.0180)	(0.0020)	(0.0221)	(0.0032)
educ	-0.0182	-0.0104	-0.0286**	-0.0530***	0.0400**	0.0035
			(0.0141)	(0.0007)	(0.0190)	(0.0027)
age10	-0.0037	-0.0069	-0.0107***	-0.0269***	0.0228***	0.0022***
			(0.0026)	(0.0012)	(0.0061)	(0.0008)
Family size	-0.0086	0.0011	-0.0074	-0.0048***	0.0005	-0.0002
			(0.0087)	(0.0004)	(0.0119)	(0.0017)
confidence	-0.1043	-0.0235	-0.1279***	-0.1830***	0.1199***	0.0089**
			(0.0127)	(0.0079)	(0.0335)	(0.0043)
trust		-0.0044	-0.0044	-0.0104	0.0135	0.0014
			(0.0093)	(0.0217)	(0.0280)	(0.0029)
Have more give more		-0.1006	-0.1006***	-0.2357***	0.3050***	0.0313 ***
			(0.0105)	(0.0246)	(0.0318)	(0.0033)
inadequacy		0.0354	0.0354***	0.0830***	-0.1074 ***	-0.0110***
			(0.0092)	(0.0215)	(0.0278)	(0.0029)

[1.] Standard errors are shown in parentheses. ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

Table A8
ZIOP Marginal Effects, Less-religious Group

	Prob (g=0)			Prob (g=1)	Prob (g=2)	Prob (g=3)
	Non-participation Pr(τ=0)	Zero contribution Pr(τ=1,$\tilde{g}$=0)	Full Pr(g=0)			
gender	-0.0316	-0.0224	-0.0540*** (0.0099)	-0.0599*** (0.0231)	0.0350*** (0.0129)	0.0027* (0.0015)
Race	-0.0095	-0.0242	-0.0337*** (0.0115)	-0.0401 (0.0337)	0.0308 (0.0231)	0.0026 (0.0026)
bornusa	-0.0254	0.0408	0.0154 (0.0100)	0.0261 (0.0320)	-0.0401* (0.0233)	-0.0039 (0.0026)
ownrent	-0.0509	-0.0505	-0.1014*** (0.0090)	-0.1147*** (0.0225)	0.0731*** (0.0135)	0.0058*** (0.0016)
employed	-0.0245	-0.0060	-0.0305*** (0.0095)	-0.0321 (0.0232)	0.0140 (0.0136)	0.0009 (0.0016)
income	-0.0073	-0.0190	-0.0262*** (0.0022)	-0.0312*** (0.0043)	0.0241*** (0.0020)	0.0020*** (0.0002)
childyes	-0.0048	0.0222	0.0175* (0.0089)	0.0233 (0.0279)	-0.0244 (0.0200)	-0.0023 (0.0023)
educ	-0.0669	-0.0054	-0.0723*** (0.0137)	-0.0738** (0.0296)	0.0253* (0.0151)	0.0013 (0.0018)
age10	0.0113	-0.0024	0.0089*** (0.0014)	0.0082* (0.0049)	-0.0004 (0.0037)	0.0001 (0.0004)
Family size	0.0086	0.0273	0.0359*** (0.0047)	0.0431*** (0.0136)	-0.0341*** (0.0092)	-0.0029*** (0.0011)
confidence	-0.1581	-0.0305	-0.1886*** (0.0054)	-0.1966*** (0.0241)	0.0803*** (0.0207)	0.0050** (0.0023)
trust		-0.0432	-0.0432** (0.0196)	-0.0114** (0.0052)	0.0501** (0.0227)	0.0045** (0.0020)
Have more give more		-0.1858	-0.1858*** (0.0190)	-0.0490*** (0.0050)	0.2156*** (0.0220)	0.0193*** (0.0020)
inadequacy		0.0104	0.0104 (0.0172)	0.0027 (0.0045)	-0.0121 (0.0200)	-0.0011 (0.0018)

[1.] Standard errors are shown in parentheses. ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

APPENDIX D: VARIABLES DESCRIPTION OF CHAPTER 3

Table A9
Variables Description, Household Bargaining

Variables	Definition
Tax price of giving	Tax price of giving equals to 1 for non-itemizes, and it equals (1-marginal tax rate) for itemizers. Marginal tax rates for all households are calculated from information such as itemization status, income, filing status, and etc.
Income	Total income for the household in the relevant year
Age of husband	Age of husband
Age of wife	Age of wife
Husband high school graduate, attended college, college graduate	Indicator variables for highest level of education obtained, as appropriate. The base group is those who did not complete high school.
Wife high school graduate, attended college, college graduate	Indicator variables for highest level of education obtained, as appropriate. The base group is those who did not complete high school.
Husband Hispanic	Dummy variable equals 1 if husband is Hispanic
Wife Hispanic	Dummy variable equals 1 if wife is Hispanic
Husband Church goer	It equals 1 if husband claims to go to church at least 12 times a year
Wife Church goer	It equals 1 if wife claims to go to church at least 12 times a year
Husband health	Dummy variable equals 1 if husband's health condition is at least good
Wife health	Dummy variable equals 1 if wife's health condition is at least good
Husband employed	Indicator variable of husband's current employment status
Wife employed	Indicator variable of wife's current employment status
Husband protestant	Dummy variable equals 1 if husband is protestant
Wife protestant	Dummy variable equals 1 if wife is protestant
Urban	Dummy variable equals 1 if the household locates at urban or metropolitan area.

APPENDIX E: COUPLES BARGAINING OVER GIVING

Table A10 Basic Model of Couples Bargaining over Charitable Giving, Whole Sample

	Log of total giving $\widehat{G_{joint}} = \delta\widehat{X_J} + \varepsilon_j$	Log of total giving $\widehat{G_{husband}} = A\widehat{X_h} + \varepsilon_h$	Log of total giving $\widehat{G_{wife}} = B\widehat{X_w} + \varepsilon_w$
lntaxpricegiv	-0.784	0.245	-1.515**
	(0.707)	(0.629)	(0.588)
lnFAMINC	0.508***	0.592***	0.505***
	(0.052)	(0.047)	(0.042)
ageH	0.017***	0.022***	
	(0.005)	(0.002)	
ageW	0.008		0.025***
	(0.006)		(0.002)
highgrad_H	-0.053	-0.073	
	(0.082)	(0.072)	
highgrad_W	-0.005		0.082
	(0.081)		(0.065)
col_H	0.288***	0.284***	
	(0.086)	(0.074)	
col_W	0.181**		0.358***
	(0.084)		(0.067)
colgrad_H	0.277***	0.440***	
	(0.084)	(0.072)	
colgrad_W	0.321***		0.530***
	(0.086)		(0.068)
hispanH	-0.488***	-0.703***	
	(0.144)	(0.095)	
hispanW	-0.295**		-0.555***
	(0.145)		(0.089)
churchH	0.766***	1.062***	
	(0.077)	(0.045)	
churchW	0.435***		1.030***
	(0.082)		(0.043)
health_husband	0.061	0.087	
	(0.086)	(0.077)	
health_wife	0.076		0.099
	(0.081)		(0.067)
workingH	0.120	0.128*	
	(0.075)	(0.069)	
workingW	-0.006		-0.043
	(0.054)		(0.047)
urban	0.127**	0.064	0.099**
	(0.054)	(0.051)	(0.047)
Constant	-0.812	-2.019**	-0.189
	(0.913)	(0.815)	(0.745)

[1.] Standard errors in parentheses; [2]. *** p<0.01, ** p<0.05, * p<0.1

Table A11 Basic Model of Couples Bargaining over Charitable Giving, Strict Protestants

	Log of total giving $\widehat{G_{joint}} = \delta\widehat{X_J} + \varepsilon_j$	Log of total giving $\widehat{G_{husband}} = A\widehat{X_h} + \varepsilon_h$	Log of total giving $\widehat{G_{wife}} = B\widehat{X_w} + \varepsilon_w$
lntaxpricegiv	-0.463	0.500	-1.020
	(1.064)	(0.940)	(0.898)
lnFAMINC	0.655***	0.722***	0.636***
	(0.086)	(0.077)	(0.068)
ageH	0.010	0.017***	
	(0.008)	(0.002)	
ageW	0.008		0.019***
	(0.008)		(0.002)
highgrad_H	0.005	-0.089	
	(0.115)	(0.103)	
highgrad_W	-0.011		0.043
	(0.114)		(0.098)
col_H	0.341***	0.266**	
	(0.121)	(0.108)	
col_W	0.113		0.296***
	(0.118)		(0.100)
colgrad_H	0.343***	0.427***	
	(0.121)	(0.106)	
colgrad_W	0.288**		0.510***
	(0.123)		(0.104)
hispanH	0.658**	0.539**	
	(0.292)	(0.228)	
hispanW	-0.178		0.192
	(0.280)		(0.215)
churchH	0.934***	1.229***	
	(0.113)	(0.070)	
churchW	0.465***		1.282***
	(0.125)		(0.070)
health_husband	0.042	0.068	
	(0.114)	(0.105)	
health_wife	0.000		0.051
	(0.109)		(0.093)
workingH	0.088	0.102	
	(0.101)	(0.096)	
workingW	-0.053		-0.098
	(0.077)		(0.068)
urban	0.079	0.048	0.060
	(0.070)	(0.067)	(0.062)
Constant	-2.142	-3.220**	-1.545
	(1.450)	(1.277)	(1.171)

[1.] Standard errors in parentheses; [2]. *** p<0.01, ** p<0.05, * p<0.1

Table A12 Basic Model of Couples Bargaining over Charitable Giving, Less or Non-protestants

	Log of total giving $\widehat{G_{joint}} = \delta\widehat{X_j} + \varepsilon_j$	Log of total giving $\widehat{G_{husband}} = A\widehat{X_h} + \varepsilon_h$	Log of total giving $\widehat{G_{wife}} = B\widehat{X_w} + \varepsilon_w$
lntaxpricegiv	-0.720	-0.197	-1.715**
	(0.906)	(0.815)	(0.744)
lnFAMINC	0.448***	0.513***	0.438***
	(0.061)	(0.057)	(0.050)
ageH	0.025***	0.028***	
	(0.007)	(0.002)	
ageW	0.010		0.032***
	(0.007)		(0.002)
highgrad_H	-0.190*	-0.154	
	(0.112)	(0.096)	
highgrad_W	-0.001		0.035
	(0.110)		(0.084)
col_H	0.137	0.197**	
	(0.116)	(0.099)	
col_W	0.180		0.286***
	(0.115)		(0.087)
colgrad_H	0.165	0.389***	
	(0.111)	(0.093)	
colgrad_W	0.327***		0.481***
	(0.114)		(0.085)
hispanH	-0.572***	-0.726***	
	(0.156)	(0.103)	
hispanW	-0.198		-0.512***
	(0.160)		(0.094)
churchH	0.459***	0.709***	
	(0.101)	(0.058)	
churchW	0.331***		0.653***
	(0.104)		(0.054)
health_husband	0.171	0.154	
	(0.127)	(0.110)	
health_wife	0.159		0.152*
	(0.114)		(0.092)
workingH	0.158	0.115	
	(0.106)	(0.096)	
workingW	0.007		-0.024
	(0.073)		(0.062)
urban	0.305***	0.201**	0.249***
	(0.085)	(0.078)	(0.070)
Constant	-0.847	-1.268	0.241
	(1.128)	(1.021)	(0.922)

[1.] Standard errors in parentheses; [2]. *** p<0.01, ** p<0.05, * p<0.1

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M.A. Applied Economics, University of Cincinnati *June 2010*
B.A. International Economics and Trade, Nanchang University, China *July 2007*

Research Interests

Applied Microeconomics, Applied Econometrics, Forecasting

Dissertation: "The Economics of Individual Philanthropy: Essays on Religiosity, and Charitable Giving by Married Couples"
Committee: Thomas A. Garrett (Chair); Walter Mayer; Natalia A. Kolesnikova; Xin Dang

Research Experience

-Research on the Economics of Philanthropy for U.S. Households *December 2012 - Present*

-Research Assistant for Dr. Thomas A. Garrett, University of Mississippi
August 2012 – May 2015

- Micro-project: Quantifying the relationship between charitable contribution and the "crowding-out" effect of government spending

-Research Assistant for Dr. Michael Belongia, University of Mississippi
January 2012 - August 2014

- Macro-project (1) "A 'Working' Solution to the Question of Nominal GDP Targeting"
- Macro-project (2) "Whither Velocity: Implications of Measurement on Inferences about the Stability of Economic Relationships"
- Macro-project (3) "Where Simple Sum and Divisia Monetary Aggregates Part: Illustrations and Evidence for the United States"

-Research Assistant for Dr. Huichen Wang, University of Mississippi *January - May 2012*

- Micro-project: State Cigarette Tax Policies

-Research Assistant for Dr. William Shughart II, University of Mississippi
August 2010 - May 2011

- Provided initial reviews of manuscripts submitted to the Journal "Public Choice"
- Focused on mathematical models and econometric testing of public choice theories.

-Research Assistant for Dr. Ouyang Youwang, Nanchang University *February - August 2007*

- Micro-project: New Countryside Industrial Foundation Construction of Jiangxi Province--Aspects of Open-type Agriculture

Teaching Experience

- Instructor *Fall 2012,Spring 2013,Fall 2013,Spring 2014,Fall 2014,Spring 2015*

Principles of Microeconomics, the University of Mississippi

- Teaching Assistant

Fall 2008,Winter 2008,Spring 2009,Fall 2009,Winter 2009,Spring 2010

Intermediate Microeconomics, Intermediate Macroeconomics and Econometrics, University of Cincinnati

Conference Presentations

Southern Economic Association 84th Annual Meeting	*Nov. 2014*
Association for Research on Nonprofit Organizations and Voluntary Action 43rd Conference	*Nov. 2014*
Midwest Economics Association 77th Annual Meeting	*Mar. 2014*
Southern Economic Association 83th Annual Meeting *(Session Chair)*	*Nov. 2013*
Missouri Valley Economics Association 50th Annual Meeting *(Session Chair)*	*Oct. 2013*
Missouri Valley Economics Association 49th Annual Meeting	*Oct. 2012*
Society of Business, Industry and Economics	*Apr. 2012*
Society of Business, Industry and Economics	*Apr. 2011*
Norwegian School of Economics and Business Administration, Bergin, Norway	*Jun. 2009*

Working Papers

"Is Howard More Generous Than Heidi? Religiosity and Gender Difference in Charitable Giving", *Under Review*

"Charitable Giving by Married Couples: Who is Prevailing in the Bargaining?"

"Preferences towards Donating Time and Money: A comparison of Housewives and Professional Women"

"Approach of Rolling-origin and Fixed-origin Evaluations for forecasting Unemployment Rates: Application to Ohio Unemployment Rates Data"

Grants and Awards

University Research Scholarship at University of Mississippi	*2010-Present*
Graduate Instructor Excellence in Teaching Award	*2015*
Certified SAS Base Programmer	*2015*
Best Poster Presentation Award, Association for Research on Nonprofit Organizations and Voluntary Action (ARNOVA)	*2014*

Graduate School Research Grants from the University of Mississippi *2013*
University Graduate Scholarship at University of Cincinnati *2008-2010*
International Research Grants from University of Cincinnati *2009*
Research Enrichment Scholarship from Charles Phelps Taft Research Center *2009*

Professional Activity

Membership

American Economic Association; Southern Economic Association; Midwest Economics Association; National Association for Business Economics; ARNOVA

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Senator for Graduate Student Council Senate, University of Mississippi *2014-2015*
Business and Finance Chair of "Model APEC 2010", Greater Cincinnati World Affairs Council *2010*

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